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PROCEEDINGS

OF THE

MICHIGAN STATE

PHARMACEUTICAL

ASSOCIATION.

FIFTH ANNUAL MEETING.

1887.

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PHARMACEUTICAL

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FIFTH ANNUAL MEETING.

1887.

PARKE, DAVIS & CO.,

Manufacturing Chemists,

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Standard Medicinal Preparations,

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We wish to call the especial attention of the pharmacists of Michigan to our very complete line of

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We can supply in the form of gelatin-coated pills most of the officinal and popular formulæ and many new and valuable combinations.

Among the merits of our pills which make them preferred by pharmacists and physicians we may mention the following, viz:

They are made entirely by hand from the purest materials, and carefully coated by a method avoiding the application of any degree of heat which could impair their efficacy.

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Manufacturing Chemists,

NEW YORK {60 MAIDEN LANE AND 21 LIBERTY STREET.

DETROIT, MICH.

PROCEEDINGS

OF THE

MICHIGAN STATE

Pharmaceutical Association,

AT ITS

FIFTH ANNUAL MEETING,

HELD AT

PETOSKEY,

July 12, 13 and 14, 1887.

ALSO, THE

CONSTITUTION AND BY-LAWS, ROLL OF MEMBERS, ETC.

DETROIT:
D. O. HAYNES & COMPANY,
1887.

NOTICE.

MEMBERSHIP.

Blank applications for membership will be furnished by the Secretary upon request.

PROCEEDINGS.

Extra copies of the Proceedings can be obtained of the Secretary at the following prices:

Proceedings of 1883	25 cents.
Proceedings of 1884	50 cents.
Proceedings of 1885	50 cents.
Proceedings of 1886	50 cents.
Proceedings of 1887	50 cents.

N. B.—If you change your residence, if your name or address is incorrectly given in the Membership Roll, or if you learn of the death of a fellow member, please notify the Secretary at once.

The next annual meeting of the Association will be held in Detroit, October 9, 10 and 11, 1888.

STANLEY E. PARKILL, *Secretary*,
Owosso, Mich.

General List
S 5 2

Past Officers of the Association.

PRESIDENTS.

FRANK WELLS,	Lansing, 1883–84
G. W. CROUTER,	Charlevox, 1884–85
H. J. BROWN,	Ann Arbor, 1885–86
F. J. WURZBURG,	Grand Rapids, 1886–87

VICE-PRESIDENTS.

ISAAC WATTS,	Grand Rapids, 1883–84
I. LEROY H. DODD,	Buchanan, 1883–84
WILLIAM B. WILSON,	Muskegon, 1883–84
GEORGE McDONALD,	Kalamazoo, 1884–85
BURR D. NORTHRUP,	Lansing, 1884–85
FRANK J. WURZBURG,	Grand Rapids, 1884–86
A. B. STEVENS,	Detroit, 1885–86
FRANK INGLIS,	Detroit, 1885–87
MRS. C. H. TAYLOR,	Loomis, 1886–87
HENRY HARWOOD,	Ishpeming, 1886–87

SECRETARIES.

JACOB JESSON,	Muskegon, 1883–85
STANLEY E. PARKILL,	Owosso, 1885–87

LOCAL SECRETARIES.

A. W. ALLEN,	Detroit, 1883–85
WM. L. WHITE,	Grand Rapids, 1885–86
GUY M. HARWOOD,	Petoskey, 1886–87

TREASURER.

WM. DUPONT,	Detroit, 1883–87

Officers of the Association.

1887-88.

PRESIDENT.

A. BASSETT, - - - - - - Detroit.

VICE-PRESIDENTS.

GUY M. HARWOOD, - - - - Petoskey.
H. B. FAIRCHILD, - - - - Grand Rapids.
H. KEPHART, - - - - - Berrien Springs.

SECRETARY.

STANLEY E. PARKILL, - - - - Owosso.

LOCAL SECRETARY.

JAMES VERNOR, - - - - - - Detroit

TREASURER.

WM. DUPONT, - - - - - - Detroit.

EXECUTIVE COMMITTEE.

GEORGE GUNDRUM, - - - - - Ionia.
FRANK INGLIS, - - - - - - Detroit.
A. H. LYMAN, - - - - - Manistee.
J. E. PECK, - - - - - Grand Rapids.
E. T. WEBB, - - - - - - Jackson.

Committees, 1887-88.

TRADE INTERESTS.

F. J. WURZBURG, - - - - Grand Rapids.
R. L. LATIMER, - - - - - Jackson.
JOHN WILLIAMSON, - - - - - Detroit.

PHARMACY AND QUERIES.

A. B. PRESCOTT, - - - - - Ann Arbor.
O. EBERBACH, - - - - - Ann Arbor.
H. J. BROWN, - - - - - Ann Arbor.

LEGISLATION.

FRANK WELLS, - - - - - - Lansing.
D. B. PERRY, - - - - - West Bay City.
G. J. PARKER, - - - - - Port Huron.

ADULTERATIONS.

A. B. LYONS, - - - - - - Detroit.
D. E. PRALL, - - - - - East Saginaw.
H. W. SNOW, - - - - - - Detroit.

MEMBER OF COMMITTEE ON UNOFFICIAL FORMULARY.

A. B. STEVENS, - - - - - Ann Arbor.

EDITOR OF PROCEEDINGS.

A. B. LYONS, - - - - - Detroit.

Delegates.

AMERICAN PHARMACEUTICAL ASSOCIATION.

MEETING AT CINCINNATI SEPT. 5, 1867.

DELEGATES.	ALTERNATES.
A. B. Lyons, Detroit.	S. E. Parkill, Owosso.
William Dupont, Detroit.	Frank Inglis, Detroit.
A. B. Stevens, Ann Arbor.	O. Eberbach, Ann Arbor.
C. G. Stone, Detroit.	J. Lamoreaux, Lakeview.
George Gundrum, Ionia.	F. N. Latimer, Ludington.

AMERICAN PHARMACEUTICAL ASSOCIATION.

MEETING, 1868.

DELEGATES.	ALTERNATES.
A. B. Prescott, Ann Arbor.	F. J. Wurzburg, Grand Rapids.
C. H. Wagener, Big Rapids.	Frank Wells, Lansing.
A. B. Lyons, Detroit.	A. B. Stevens, Ann Arbor.
W. A. Hall, Greenville.	Jacob Jesson, Muskegon.
R. S. Latimer, Jackson.	E. T. Webb, Jackson.

ILLINOIS PHARMACEUTICAL ASSOCIATION.

MEETING, 1868.

G. W. Crouter, Charlevoix. | Wm. L. White, Grand Rapids.
F. W. R. Perry, Detroit.

INDIANA PHARMACEUTICAL ASSOCIATION.

MEETING, FORT WAYNE, JUNE 5, 1868.

Henry Harwood, Ishpeming. | C. E. Foote, Jackson.
H. N. Dean, Niles,

OHIO PHARMACEUTICAL ASSOCIATION.

MEETING, COLUMBUS, JUNE 13, 1868.

A. W. Allen, Detroit. | A. B. Lyons, Detroit.
Theodore Trowbridge, Decatur.

WISCONSIN PHARMACEUTICAL ASSOCIATION.

MEETING, PALMYRA, AUGUST 7, 1868.

W. J. Sawyer, Menominee. | J. G. Johnson, Traverse City.
Jacob Jesson, Muskegon.

Committee on Local Organization and Membership.

A. BASSETT, CHAIRMAN, Detroit.

County.	Name.	Residence.
Alcona	B. F. Buchanan	Harrisville.
Allegan	C. H. Adams	Otsego.
Alpena	Charles Howard	Alpena.
Antrim	O. L. Rodenbaugh	Mancelona.
Barie	F. Hotchkiss	Hastings.
Bay	F. H. J. van Emster	Bay City.
*Berrien	H. Kephart	Berrien Springs.
Branch	C. D. Wicker	Coldwater.
Calhoun	F. S. Parker	Battle Creek.
Cass	C. L. Sherwood	Dowagiac.
*Charlevoix	G. W. Crouter	Charlevoix.
Cheboygan	C. A. Bigbee	Cheboygan.
*Clare	J. W. Dunlop	Clare.
Clinton	A. O. Hunt	St. Johns.
Delta	J. N. Mead	Escanaba.
Emmett	A. L. Thompson	Harbor Springs.
Eaton	H. A. Blackmar	Charlotte.
Hillsdale	E. C. Varnum	Jonesville.
Huron	I. D. Lane	Sand Beach.
Ingham	F. M. Alsdorf	Lansing.
*Ionia	George Gundrum	Ionia.
*Isabella	C. W. Taylor	Loomis.
*Jackson	E. T. Webb	Jackson.
*Kalamazoo	George McDonald	Kalamazoo.
Kalkaska	H. E. Stover	Kalkaska.
*Kent	F. J. Wurzburg	Grand Rapids.
Lapeer	F. E. Bristol	Lapeer.
Lenawee	H. D. Pegg	Morenci.
Livingston	F. E. Judson	Brighton.
Manistee	A. H. Lyman	Manistee.
Marquette	Henry Harwood	Ishpeming.

*Has a County Association.

County.	Name.	Residence.
*Mason	F. N. Latimer	Ludington.
*Mecosta	C. H. Wagener	Big Rapids.
Menominee	R. J. Sawyer	Menominee.
Midland	M. Anderson	Midland.
Missaukee	M. J. Roach	Lake City.
*Monroe	S. M. Sackett	Monroe.
Montcalm	J. H. Passage	Greenville.
Muskegon	J. R. Tweedale	Muskegon.
Newaygo	J. F. A. Raider	Newaygo.
Oakland	J. S. Hewell	Milford.
*Oceana	F. W. Fincher	Pentwater.
Ontonagon	J. L. Strong	Bessemer.
*Otsego	N. P. Blakeslee	Elmira.
Ottawa	Henry Baar	Grand Haven.
*Saginaw	D. E. Prall	East Saginaw.
St. Joseph	J. V. Okey	Colon.
Sanilac	James Fisher	Marlette.
Schoolcraft	E. W. Orr	Manistique.
Shiawassee	W. H. Bigelow	Owosso.
Traverse	James G. Johnson	Traverse City.
Tuscola	E. A. Bullard	Vassar.
Van Buren	T. Trobridge	Decatur.
Washtenaw	H. J. Brown	Ann Arbor.
*Wayne	A. W. Allen	Detroit.
Wexford	R. J. Cummer	Cadillac.

*Has a County Association.

MEMBERS

OF THE

Michigan State Board of Pharmacy

FOR 1887-8.

JAMES VERNOR, Detroit, - - - - Term expires Dec. 31, 1888.
OTTMAR EBERBACH, Ann Arbor, - Term expires Dec. 31, 1889.
GEORGE McDONALD, Kalamazoo, - - Term expires Dec. 31, 1890.
STANLEY E. PARKILL, Owosso, - Term expires Dec. 31, 1891.
JACOB JESSON, Muskegon, - - - Term expires Dec. 31, 1892.

Officers of the Board.

PRESIDENT.

GEORGE McDONALD, - - - - - - - Kalamazoo.

SECRETARY.

JACOB JESSON, - - - - - - - - - Muskegon.

TREASURER.

JAMES VERNOR, - - - - - - - - - Detroit

MEETINGS.

The regular meetings of the Board are held on the first Tuesday of March, July and November. Special meetings at the call of the Board.

MINUTES

OF THE

FIFTH ANNUAL MEETING

OF THE

Michigan State Pharmaceutical Association.

FIRST SESSION.

TUESDAY FORENOON, July 12, 1887.

The Association met in Mitchell's Hall, Petoskey, at 10 o'clock A. M., and was called to order by the President, Frank J. Wurzburg, of Grand Rapids, who said:

LADIES AND GENTLEMEN: It gives me great pleasure to meet so many familiar faces, and to see so many present who have not met with us before. I am also glad to see so many ladies present, and I hope they will lend their presence to our meetings. The meeting will now be opened with prayer by the Rev. Mr. Johnson.

Prayer by Rev. Mr. Johnson.

THE PRESIDENT—I have the honor of introducing the Hon. D. C. Page, President of the Village of Petoskey.

ADDRESS OF WELCOME.

MR. PRESIDENT AND GENTLEMEN OF THE PHARMACEUTICAL ASSOCIATION OF MICHIGAN, AND LADIES: I appear before you to-day, not as one holding any intimate personal relation with your profession, but as the representative of the good people of this town, who desire through me to extend to you their welcome.

Organization in every art and industry is the key-stone to success. I am happy and proud to participate in the opening of this convention. It is not often that so many men are assembled together who properly

may be called public benefactors. The business in which you are engaged as pharmacists draws you so closely to the human family that all of us who suffer "the ills that flesh is heir to," must be impressed that the objects you have in view in assembling here are important. To me it is a matter of surprise that in this progressive day there never have been until quite recently, in this country, laws regulating the practice of pharmacy. In continental Europe and Great Britain for a long time those who prepared prescriptions and compounded medicines have been required to pass strict examinations, but in the United States it is only lately that laws upon this subject have been passed.

I congratulate the members of this Association who, by their efforts, three or four years ago, succeeded in securing the passage of a pharmacy law in the State of Michigan. In view of your success in carrying through a measure which must raise the standard of skill for those required to act in the capacity of druggists, I say you should be regarded as public benefactors.

I represent here to-day the people of this town, who are always pleased to welcome such assemblages as yours, which gather for a good and lawful purpose. It is not my intention to take up your time at any considerable length this morning, but I cannot close my remarks without alluding to your fellow and our fellow townsman, the late L. W. Cole. It is perhaps due to say to you who had but a slight acquaintance with him, that we who knew him so well can bear testimony to the high character he bore in this his home. He was one of our leading men, honorable in his private affairs, public spirited perhaps to a fault, the soul of integrity in his business, and his death must fall alike sadly upon his family, upon you as an Association, and upon the community at large. You will miss him to-day, and we shall all miss him in the future.

Gentlemen of the Convention, I hope your business here will prove profitable, that your stay will prove enjoyable, and I extend to you such hospitalities as we are able to afford.

RESPONSE BY MR. S. E. PARKILL.

Mr. PRESIDENT: In behalf of the Michigan State Pharmaceutical Association, I thank you for this cordial welcome to your city. Petoskey is not unknown to us, sir, it has become a household word with thousands of people in our own and other States. The weary invalid sighing away the hours on a bed of sickness, thinks of it and longs for a breath of its health-giving, bracing air. The gay drummer thinks of it as he turns his footsteps northward in the middle of the week. The maiden of unknown age and untold experiences, thinks of it as she plans another season's campaign. The lover of good tobacco thinks of it as he gazes at the flaming lithographs pasted on barns and fences advising all who love the weed to chew Petoskey fine cut. Years ago this departed chief's

ancestors used, literally, to make fine cut of the white man, and now we take a grim sort of satisfaction in chewing his namesake. The hay fever subject thinks of it as he sleeps standing in the sunny south, and this brings me to the cause of our being here, Mr. President. We have had a severe attack of hay fever in the southern part of Michigan for the past two weeks; the crop has been unusually large, and we have found it absolutely necessary to come north to rest and breathe easily for a time.

Petoskey, Petoskey, what a name! It has in it the whispered melody of your sighing northern pines, the music of your boisterous brooks, the singing of the wind as it blows caressingly landward, and the splash of old lake Michigan's mighty waves upon your agate-strewn shores. Petoskey, a name that has become a synonym for good health and good cheer—though I understand, Mr. President, that years ago, when his grand-fathers raised the war-whoop upon the startled ear of night, bald-headed men were at a premium among white folks.

This is a peculiarly appropriate place for the meeting of this Association. But a few years ago this place where we are now gathered was an uninhabited wilderness. Your city has grown with such magic haste that the grass has yet scarce overgrown the Indian trails that run through your suburbs. We, too, are young, and our growth has been of such marvelous rapidity that to-day, though among the youngest, we stand second to but one State Association in point of numbers; in the value and quality of our work we stand the peer of any.

Petoskey, sitting here in beauty on her sunny hillsides, looks out upon unlimited opportunities for trade and commerce. We pharmacists gathered here look out upon a vast but not unknown sea of pharmaceutical research. May we both achieve that measure of success our abilities, our opportunities and our earnest work entitles us to. In closing, I wish once more to express our thanks to you for your welcome. the heartiness of which recalls those lines of Burns, familiar to us all:

"I'd ask no more in heaven itself
Than just a Highland welcome."

On motion of Mr. Wells, the reading of the minutes of the last meeting was dispensed with.

Mr. Inglis, of Detroit, was called to the Chair, and the President read his address, as follows:

PRESIDENT'S ADDRESS.

GENTLEMEN OF THE MICHIGAN STATE PHARMACEUTICAL ASSOCIATION: To-day we have laid aside our business cares, burdens, and duties, that we may again meet in this, the fifth annual reunion of our existence as an organized Association, and continue in the work of promoting the objects which brought our Association into being. What

these objects are is known to you all, and that you are in sympathy with our aims and wishes, the fact of your presence gives ample evidence.

In this, our fifth annual reunion, we have to lament that since we last met together some of our co-laborers have been called from among us to pass to that mysterious bourne, towards which the footsteps of all tend, and yet from which none return. Still, we have cause for thankfulness that so many have been permitted to meet and renew their labors; to promote the usefulness of a profession that has for its object the alleviation of human suffering and the prolonging of human life.

In accordance with the resolution adopted at our fourth annual meeting, held at Grand Rapids, instructing the President to appoint a committee of one from each county to work up local and county Associations, I issued the following circular letter early in November, and sent the names of fifty-four members to the Secretary, who kindly noted certain changes and additions, and promptly mailed printed copies:

CIRCULAR.

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION,
PRESIDENT'S OFFICE, GRAND RAPIDS, MICH., ——, 1886.

To Mr. .....

DEAR SIR: In accordance with a resolution adopted at the fourth annual meeting of the Michigan State Pharmaceutical Association, I hereby designate you a committee of one to work up the subject of local organization in your county.

The benefits of local organizations are admirably shown in the various local societies organized in Michigan during the past three years, and while concerted action among druggists is a direct benefit to the trade interested, it is also a strong support to the State Association. Copies of the constitution and by-laws of either the Detroit Pharmaceutical Society, or the Grand Rapids Pharmaceutical Society, will be furnished on application to the Secretary of either Society. Sample copies of Price Book and agreement adopted by the Grand Rapids Pharmaceutical Society can also be had by applying to F. E. Escott, Secretary Grand Rapids Pharmaceutical Society.

Trusting that you will take hold of the matter and push the work to a successful issue, I am respectfully yours,

F. J. WURZBURG, President M. S. P. A.

As a result of the labors of these committees, fourteen Associations have been organized. I would earnestly recommend the continuance of this work by the appointment of another special committee on local and county Associations for the coming year. A strong effort should be made to organize in every county. The benefit of local organization was fully illustrated to my mind during our late struggle with the Legislature over the liquor bill. April 30th I issued the following call for a meeting to be held at Lansing:

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION,
GRAND RAPIDS, April 30, 1887.

DEAR SIR: The bill reported yesterday by the House Committee on Liquor Traffic, classing druggists as saloon-keepers and providing for an annual tax of $500, comes up in the House on Thursday afternoon, May 5.

It is imperative that you be present at a meeting of delegates from other parts of the State, on Wednesday evening, to consider the best means of combatting such legislation.

F. J. WURZBURG, President.

I mailed one hundred copies of these to different portions of the State. About twenty-five members were present at this meeting, and I think I am safe in saying that seventy-five per cent. of those present represented local societies. The Grand Rapids Association has, during the past year, compiled and published a price book of proprietary goods that for completeness cannot be excelled. This book has also been adopted by several county Associations, the adoption in each case being followed by a noticeable increase in the margins on proprietary articles.

An Act enabling this Association to become incorporated having been passed by the Legislature, and the necessary formalities having been attended to by the chairman of the Legislative Committee, we shall soon be a legally organized body with full corporate powers. Inasmuch as the officers to be elected at this convention will be the officers of the new organization, I suggest that we vote to disband at the close of the afternoon session and adjourn *sine die*, in order that the old organization may be merged into the new at the opening session to-morrow morning.

Now that we are to become incorporated we shall be entitled to representation on the committee to revise the Pharmacopean, and I suggest that such representatives be appointed at this convention.

The most important work which this Association has undertaken since the struggle over the enactment of the Pharmacy law, has been the defeat of legislation inimical to the drug trade at the hands of the last Legislature. But for the prompt action taken by the Association, every druggist in Michigan would now be compelled to submit to the disgrace of being classed with saloonists.

With the details of this work and the weapons used to combat such legislation, the trade is probably well acquainted. Suffice it to say that a meeting of the officers and Executive Committee of this Association was held at Lansing on April 19th, at which time appropriate resolutions and a strong memorial were adopted and presented to the Legislature. We have undeniable evidence that this action had great weight with at least a portion of the Legislature, but it was deemed necessary to call a general meeting of members on the date set for the discussion of the bill in the House. This meeting convened on May 4th, and did not adjourn until the following day, and although the initial vote of the House gave grounds for no encouragement, subsequent developments proved that the meeting was not without results.

The trade has reasons for congratulation that it escaped such iniquitous legislation, and all the credit for the work belongs to this Association. In this connection I desire to impress upon those druggists who are not members of our Association, the fact that they should discharge their obligation to the Association by uniting with us without further delay. Why any druggist should participate in the benefits secured by this Association without contributing to its support, is a constant reminder that men, as well as republics, are sometimes ungrateful.

While I am speaking of the obligation under which non-members are resting, I am led to refer to the duty some of our own members owe the Association. The Secretary informs me that a considerable number of our members are behind two years in paying their dues, and some three years. As an incentive to pay these arrearages, I suggest that copies of our proceedings be mailed only to those who are less than two years in arrears.

In the organization of commercial bodies where the sole object to be attained is gain, and the only reward desired is money, and the only intellectuality required or expected of an order calculated to promote profit, we do not look for or expect any progress toward a higher development than the introduction of such machinery and ideas as seem to best serve the acquirement of the financial object in view. The Michigan State Pharmaceutical Association is not an organization of this character. The mercantile element is foreign to its objects. The advancement to an increased knowledge of our art is an ambition to which we may justly aspire. The great majority of our members recognize the object of our labors, by not only devoting their time to its meetings, but we have learned by practical illustration that their loyalty is such that when an emergency calls, they may be relied upon to respond to any demand for the good of the Association.

At this meeting I have the pleasure to announce that Michigan has the largest membership of any similar Association, while its papers and work rank with the best talent of the older societies.

But on the other hand, let us not exalt ourselves beyond our real accomplishments, and let us not turn our eyes from an evil that threatens to become an element of disaster and ruin.

What this gigantic evil is to which I refer, those of us know who were summoned to Lansing to protest against proposed legislation, classing the entire pharmaceutical profession of the State of Michigan as saloon-keepers. On that occasion we were obliged to listen to a statement made upon the floor of the House of Representatives, that ninety-nine out of every hundred druggists of the State of Michigan were no better than saloon-keepers, and when we reflected that such a statement was made by no less a personage than the Speaker of the House, we hung our heads in shame and indignation. In shame, because we know from

evidence indisputable that many members of our profession were, as Mr. Markey publicly stated, no better than saloon-keepers. In indignation, because we know that the statement was incorrect and unjustifiable by actual facts. But unjust only as regards members, and righteous as applied to the men who call themselves pharmacists, but who permit their avarice to prostitute our profession to promote their illegal business. They are willing for a few dollars to bring into disrepute our respectable calling, and to sink us all to the level of the dram shop.

I cannot find language too strong for their condemnation, and I trust that you will concur with me in the expressions I have used toward this class. Men who sell liquor by the glass are not wanted in the ranks of this society. I trust that the moral influence of this society may be brought against any pharmacist guilty of this practice, and that the heavy arm of the law may fall with great severity upon such offenders as may continue to bring disgrace upon us.

In this connection I will state that these transgressions were not committed to any extent by the members of this Association, but by those of our profession who have not joined us; for it will be remembered that out of over three thousand druggists of Michigan, only eight hundred belong to our Association. Only the necessities of this subject led me to introduce it at this meeting, and I trust that with the penalties affixed for the violation of the new liquor law as applied to druggists and their enforcement will deter offenders who otherwise would bring great injury to this society by their nefarious practice.

A Detroit member of this Association informs me that the abuse of jobbers selling at retail shows no abatement at that market. This is a serious matter for the retail dealer, as it deprives him of margins which are justly his. I have no suggestions to offer in the premises, and I hope that the Committee on Trade Interests will devise some method to put an end to this abuse.

The growing importance of the Michigan School of Pharmacy is a source of pride to every pharmacist in the State, and the obligation under which it has placed this Association cannot be overestimated.

The relation of the pharmacist to his apprentice is a pertinent subject at this time, and the Association can devote a short discussion to this subject with profit all around.

I would recommend that our Secretary be instructed to attend the meeting of State Secretaries, held in conjunction with the meeting of the A. P. A., as such an expenditure would be more than repaid by the information he would gain on organization, membership, and other matters of importance.

The appointment of Jacob Jesson to succeed himself as a member of the State Board of Pharmacy, will meet the approval of this Association.

In this connection, however, I desire to put myself on record as favoring a return to the original intent of the law when it was enacted, that this Association recommend three or more eligible persons for appointment to the Board, and that such recommendations be forwarded to the Governor, with a request to make his selection therefrom.

I make this recommendation in view of the fact that the Board owes its existence to this Association, and that it cannot be brought too closely in connection with the parent organization.

Delegates were appointed to attend the meetings of the Ohio, Indiana and Illinois State Associations. The meeting of the Illinois Association having been postponed until August, the delegates did not qualify, and I suggest that delegates be elected at this meeting.

In conclusion, I desire to return my thanks to the members of the Association for the cordial support given me in the discharge of my duties; to Secretary Parkill for the painstaking manner in which he has conducted the work in his department; to Frank Wells, for securing the passage of the incorporation bill, and for his vigilance and advice in the trying times incident to the discussion of the liquor bill; to all other officers and committees for their effective work in behalf of the Association. While the year I have spent as your presiding officer has not been without its perplexities, I have managed to derive much pleasure in the discharge of the duties devolving upon this office, and I take this opportunity of thanking you for the honor conferred upon me.

On motion of Mr. Brown of Ann Arbor, the President's address was accepted and referred to a committee to be appointed by the Chair which should be instructed to report upon the recommendations contained therein to the Association.

THE PRESIDENT—I will announce the committee at the opening of the session this afternoon. The election of new members is in order.

THE SECRETARY — The following applications have been received and favorably acted upon by the Executive Committee.

Earl Allen, Stanton.
M. A. Barber, Petoskey.
F. E. Brackett, Cheboygan.
Geo. N. Case, Cheboygan.
H. M. Dean, Niles.
James E. Dillon, East Tawas.
James Fisher, Marlette.
John A. Gebb, Benton Harbor.
Edward Pemberthy, Iron River.
H. W. Rodenbaugh, Paw Paw.
T. F. Rogers, Lakeview.
A. M. Todd, Nottawa.
Fred. P. Tillson, Ishpeming.
W. A. Watson, Breckenridge.
A. A. Weeks, Grattan.
J. R. Kestell, Detroit.

C. W. Hull, Bay City. A. B. Francis, Olivet.
Neal McMillan, Rockford. H. L. Barie, Detroit.
F. O. Marty, Manchester. M. J. Erwin, Harbor Springs.
Gustaf A. Malmgren, Ishpeming.

On motion of Mr. Wells, the Secretary was instructed to cast the ballot of the Association for these candidates, which was done, and they were declared duly elected.

Mr. WELLS—There is one portion of the President's address which it is proper for us to attend to at once, and that is concerning our re-organization. If we re-organize to-morrow morning it will be necessary to adopt a constitution and by-laws, and I therefore move that a committee of three be appointed to report at the next sitting a constitution and by-laws for the re-organized Association.

Carried.

THE PRESIDENT—I will appoint such committee: Frank Wells, Jacob Jesson and J. E. Peck.

We have with us at this meeting a druggist who is a member of the Legislature, the Hon. Neil McMillan, of Rockford. We would like to hear from Mr. McMillan.

Mr. MCMILLAN—Mr. President, I shall ask to be excused, I am not prepared to-day. I will make a speech later.

Mr. WELLS - I understand, Mr. President, that the Ohio State Pharmaceutical Association is represented here by its President, Mr. S. E. Allen, and I have no doubt the members of this Association will be very glad to hear from him.

Mr. VERNOR—I move that Mr. Allen be requested to take his seat upon the platform.

Carried.

Upon enquiry Mr. Allen was found not to be present.

Mr. BASSETT—I would like to have all persons who have anything pertaining to Trade Interests report the same to me so I may be able to make up my report to this Convention.

Dr. LYONS—The question box is now ready at the door for any one who may have questions to put into it for this afternoon.

THE PRESIDENT—I am requested to ask all persons present to register, in order that we may have the names to publish in the proceedings, and for other reasons. All who have not registered will please do so before leaving the hall. Perhaps we might occupy a short time in reading papers if there is nothing else to come before the Association.

PROF. PRESCOTT—I have here a paper by A. S. Mitchell, prepared in response to query 37: "What disinfecting and antiseptic preparations can the dispensing pharmacist make with advantage?" I will give you the substance of the paper and the results of the work as nearly as I can, without reading it in full. (For this paper and the discussion thereon, see subsequent pages.)

THE PRESIDENT—What disposition will you make of the paper read by Prof. Prescott?

Mr. JESSON—I move that this and all other papers presented at this meeting be printed in the minutes.

Carried.

SECRETARY PARKILL—I have a few more applications which the Executive Committee have acted upon and recommended for election which I desire to submit for action of the Association.

G. A. Osborne, Luther.	A. J. Dayton, Petoskey.
J. C. Bostick, Manton.	E. R. Wilson, Grand Rapids.

On motion, the Secretary was instructed to cast the ballot of the Association for the applicants, who were declared duly elected.

Mr. H. W. Snow, of Detroit, read a paper entitled, "The Alkaloidal strength of Ipecac Root, and of its Fluid Extracts." (See subsequent pages.)

THE PRESIDENT—I will announce the committee on the President's address at this time, as there are recommendations therein that ought to be acted upon as early as possible. I will name H. J. Brown, of Ann Arbor, A. Bassett, of Detroit, and G. C. Steketee, of Grand Rapids.

The Association then adjourned until 2 P. M.

SECOND SESSION.

TUESDAY AFTERNOON, JULY 12.

At 2 P. M. the Association convened with the President, F. J. Wurzburg, in the chair.

THE PRESIDENT—The first business this afternoon is the opening of the question box and the discussion of the questions.

Prof. PRESCOTT—The first question is, "What would you advise to do with a man who failed in an examination and opened up business, not employing a registered clerk?"

Mr. VERNOR—I would advise that he be prosecuted at once. Report him to the Board of Pharmacy and we will look after him.

A VOICE—I would like to ask whether it is a drug business or a saloon?

Dr. LYONS—The next question is, "How does the local option law affect the druggist?"

Mr. WELLS—It does not affect the druggist in the least.

The law expressly allows the druggist to sell liquors for mechanical, medicinal and sacramental purposes, requiring him, however, to keep a record of all such sales.

A MEMBER—Has any provision been made for the sale of liquors by druggists on legal holidays?

Mr. MCMILLAN—There is a provision made in the new law for legal holidays and Sundays. Sales may be made on prescription only, and the doctor is not allowed to be a member of the firm.

Dr. LYONS—The next question is, "What is the opinion of this Association of raising the standard of examination to sixty per cent?"

Mr. VERNOR—That is a matter entirely in the hands of the Board. According to law, the candidate shall pass such an examination as seems proper to them. At the last examination out of 71 applicants 51 passed and about twenty of those had just graduated from the University. Of the 51 applicants, not recent graduates, 31 passed on a 50 per cent. standard. There were some pretty good men who failed to pass; men who, I

think, would be able to pass the examination. You could hardly tell whether you wanted to raise it until you saw what the examination was. If Mr. Gundrum, of Ionia, is in the room he could give a pretty good idea of what the standard should be. He passed the examination and passed it high. He worked very hard and passed, and seemed to think it was high enough.

Prof. PRESCOTT—The question seems to call not for control but for advice, but it seems to me the Association can hardly give advice to the Board of Pharmacy in the premises. It necessarily rests with them in the first place, as Mr. Vernor says. No one can give any sort of judgment without knowing exactly what the examination is. Then of course the Board must be its own judge of what is success and what is failure in answering any given question. The answer given to a question may be correct but incomplete. One judge would say it was a failure, another that it was a success. So the interpretation of any such rule must rest with the body establishing the rule. The whole subject rests with the Board of Pharmacy, and they must necessarily be better qualified to judge of the proper per centage than anybody else. I have thought this Association was desirous of having the standard of qualification advanced steadily, and kept as high as it properly can be with due fairness to the present condition of pharmacy, having in mind the question of who can be furnished to do the service of a pharmacist as assistants and as proprietors in this State, and then to feel their way along. I presume I voice the sentiment of almost every member of the Association when I say that Michigan can place the fullest confidence in the State Board of Pharmacy.

Mr. VERNOR—In regard to the point made by the Professor as to the answers not being absolutely correct, I desire to say that if the candidate shows some knowledge of the question, he is given a percentage on that knowledge. I think we give the candidate everything he is entitled to beyond any question. I see Mr. Gundrum is here now, he may be able to give some information upon this point.

Mr. GUNDRUM—I think 50 per cent. is a rather low standard. In my estimation it should be raised a little, at least to 60 per cent.

Prof. PRESCOTT—I should like to inquire of the Board whether, in future, there are to be two standards or grades, one for registered assistants and one for registered pharmacists.

Mr. VERNOR—There will. It has been decided to hold a special examination hereafter for registered assistants of the lower grade.

Dr. LYONS—The next question is, "How about groceries and dry goods stores selling Paris green without a label?"

Prof. PRESCOTT—The question is one proper to be considered by the community, but hardly within the scope of this Association. Paris green is a poisonous article, but it has become one of the most common articles of trade for certain well known uses. It is sold as an insecticide and is no more dangerous than Rough on Rats, no more than a toy pistol is. I presume it is perfectly proper for us as pharmacists to give an opinion or to give advice upon such a question as that, but in the case of an article that is in such common use, I don't know as it is practicable to sell it under a label.

Mr. CALDWELL—The law requires all poisons to be labeled, and that includes Paris green. All poisons should be labeled, whether sold by the druggist or the merchant.

J. T. LAMOREAUX—One of our grocerymen got in a stock of Paris green and put out his card, "25 cents per lb" Our druggists thought best to give him a benefit, and put out a card "Five lbs. for $1.00;" whereupon he put out a card "15 cents per lb."

Dr. LYONS—It seems to me this question does fairly come within our scope as an association of druggists. It is the business of the druggist to deal in poisons and poisonous substances and it is their practice to conform to the laws regulating the sale of such. The laws are made to protect the public against special dangers, with which they are very familiar. If there comes in competition with the druggist in any part of his business a class of men who do not regard these regulations,

although it does not interfere particularly with the profits of the druggist, it is his duty to see that the laws are enforced. He cannot insist that his competitor shall sell at as high a rate as he does, but he may insist that the merchant shall be as strict in his conformance to the laws as the druggist. I think that as an Association we should do all we can towards securing enforcement of just laws which we ourselves obey.

Mr. NOEL—Does not the law prescribe what class of dealers shall sell poisons, and must they not be registered pharmacists?

THE PRESIDENT—The law allows certain articles to be sold by dealers other than pharmacists, and Paris green is one of those articles.

Mr. BUGBEE—Does not the law say they shall bear the label of a registered pharmacist?

Dr. LYONS—The Pharmacy Law expressly permits the sale of Paris green, with certain other chemicals in common use by others than pharmacists. It does not require that these articles be labeled, although in the case of poisonous tinctures, etc., it does expressly require that. If, however, we have a general law covering the case, would it not apply, notwithstanding the special permission given to dealers to handle the article? If our law does not cover Paris green, Rough on Rats, and other similar articles, it is time we had one that will.

Mr. GUNDRUM—I should like to ask if it is a fact that Paris green is being sold without being labeled.

J. S. HEWITT—I know of several grocers who do it up in packages and put it outside with no other label, except a card marked "Paris green." I think if there are laws to protect druggists, this should be one of them.

Dr. LYONS—The next question is one perhaps more appropriate for a query. It reads, "What drugs and preparations are especially liable to deterioration by age?" If there is nothing to be said on this subject, there is one more question: "What shall we do about Lubin's perfumes and Colgate's goods sold by the box at cost by wholesale houses as an advertising medium?"

SECRETARY PARKILL—When they sell for less than cost, lay in a stock.

Dr. LYONS—That is the correct answer.

The next order of business was the report from the Michigan Board of Pharmacy as required by Section 2 of "An Act to Regulate the Practice of Pharmacy in the State of Michigan." [*Act No. 134, Laws 1885.*]

The report was presented by Jacob Jesson, Secretary of the Board, an abstract of which is as follows:

The term of office of Mr. Florentin H. J. Van Emster having expired, Stanley E. Parkill, of Owosso, was appointed by Governor Luce to fill the vacancy for the term ending December 31st, 1891. Mr. Van Emster was always faithful in the discharge of his duties, and retires from the Board with the highest esteem of his colleagues. Jacob Jesson, of Muskegon, has also been re-appointed by Governor Luce for five years from December 31, 1887.

Two certificates have been cancelled; they were improperly held.

The Board has engaged Mr. James H. Kinnane, an Attorney, to prosecute for the Board, all violations of the law, when complaint is made in due form and the Board, upon investigation, find sufficient cause for prosecution. All complaints of violations should be sent to the Secretary of the Board, giving, as near as possible, the facts in the case. Such communications *will not be* used in prosecuting the case, if a prosecution is found necessary. Anonymous communications will not receive any notice whatever.

The regular meetings of the Board were held at Lansing November 2d, 3d and 4th; at Grand Rapids March 1st, 2d and 3d; at Detroit July 5th, 6th and 7th.

At the Lansing meeting 18 candidates passed and 10 failed.

At the Grand Rapids meeting 38 passed and 20 failed.

At the Detroit meeting 51 passed and 20 failed.

Successful candidates, 107; unsuccessful, 50; total examined 157.

At the examination held at Detroit, some very large percentages were made.

In	Identification of Specimens,	16	had over	80%.	Highest,	93%
"	Materia Medica	18	" "	80%.	"	98%
"	Pharmacy	8	" "	80%.	"	92%
"	Chemistry	13	" "	80%.	"	100%
"	Prescriptions	10	" "	80%.	"	95%

The highest average on the five branches was 93 per cent., the highest average made before the Board. Seven averaged over 80 per cent.

There are upon the register 2,942 names. Number of certificates in force, 2,749; 193 have been dropped; 31 assistants have been registered, and 148 have renewed; 35 failed to renew.

The average drug clerk is an uneasy person. From December 18th, 1885, to July 1st, 1887, 511 druggists have changed their post office address.

Examinations will be held for registered assistants at each of the regular meetings of the Board. The fee for such examinations is one dollar. Blanks and further particulars will be furnished by the Secretary of the Board.

The total cash received as follows:

From Renewals, Registered Pharmacists	$2,590 25
" " " Assistants	74 00
" Assistants, Registered	31 00
" 148 Applications for Examination	444 00
Cash in the hands of Treasurer at last report	758 23
Total	$3,897 48

The running expenses for the year were	$2,050 30
To be turned over to State Treasurer	1,000 00
Balance in the hands of the Treasurer	847 18
Total	$3,897 48

The vouchers covering the expenditures are in the hands of Secretary Parkill.

The Officers of the Board are:

PRESIDENT, ...	GEORGE McDONALD.
SECRETARY, ...	JACOB JESSON.
TREASURER, ...	JAMES VERNOR.

The full report is too long for publication; it includes the minutes of the meetings, the names and post-office address of the registered pharmacists and registered assistants, arranged by counties, and the vouchers, and is in the hands of Secretary Parkill, where any member of the Association can have access to it.

On motion of Dr. Lyons the report was accepted and adopted.

The Secretary announced that he had a list of applicants which had been passed upon favorably by the Executive Committee, and, the Rules being suspended, the following were elected to membership:

Orrin E. Close, Spring Lake.	J. A. McPhee, Evart.
H. H. Eaton, Boyne Falls.	I. J. Leggett, Paris.
J. M. Harris, Ironton.	L. Pauly, St. Ignace.

THE PRESIDENT—We will now listen to the report of the Secretary.

SECRETARY'S REPORT.

To the Officers and Members of the Michigan State Pharmaceutical Association:

Your Secretary respectfully submits the following report for the year 1886 and '87.

At the close of the last meeting the Association boasted a membership of 792. We have lost by death during the year five members; have dropped for non-payment of dues eight members, and one, Mr. T. J. Wrampelmeier, has resigned, making our present membership 778.

Following the instructions of the last convention, a copy of Dr. Prescott's paper, "A plan of study for the assistant in Pharmacy," was mailed to every registered Pharmacist and assistant in the State, early in January.

The publication of the proceedings was somewhat retarded because of the delay in receiving the stenographer's report. The proceedings were edited by Dr. A. B. Lyons and published by D. O. Haynes & Co. These gentlemen solicited advertisements for the issue and credited the Association with the amount received therefrom. The total cost of publication was $290.17. Credited for advertisements $110.00, leaving a net cost to the Association of $180.17.

We have received regularly complimentary copies of the *Pharmaceutical Era*, *The Michigan Tradesman*, the *Druggists' Circular* and the *Druggists' Bulletin*.

CASH RECEIVED.

From dues, fees and certificates	$726 70	
From advertisements, last year	20 00	
		$746 70

CASH PAID.

1886.			
Oct. 12.	To W. Dupont	$157 00	
14.	To W. Dupont	76 00	
July 12.	To W. Dupont	513 70	
			$746 70

The following orders have been drawn:

1886.			
Oct. 13.	No. 1. Bryant Council	$ 12 50	
13.	2. S. E. Parkill, salary	200 00	
14.	3. Wm. L. White	50 00	
14.	4. M. Trimmer, janitor	5 00	
Nov. 26.	5. Owosso *Press*	17 50	
26.	6. Calvert Lithographing Co	10 00	
27.	7. The *Times* Printing Co	4 00	
1887.			
Jan. 7.	8. J. S. Harrison	50 00	
13.	9. H. J. Brown	22 00	
28.	10. W. P. Holliday	1 25	
Feb. 9.	11. D. O. Haynes & Co	47 25	
April 12.	12. *Times* Printing Co	3 50	
12.	13. D. O. Haynes & Co	189 32	
May 13.	14. Frank Wells, printing	8 00	
July 12.	15. S. E. Parkill, postage, etc	121 45	
			$741 77

S. E. PARKILL, *Secretary.*

THE PRESIDENT—The report will be referred to the Executive Committee. We will now listen to the report of the Treasurer.

TREASURER'S REPORT.

1886.	RECEIPTS.		
Oct. 15.	To balance on hand		$ 518 38
15.	To cash	$ 157 00	
1887.	" "	76 00	
July 12.	" "	513 70	
			746 70
			$1,265 08

1886.	DISBURSEMENTS.			
Oct. 15.	No. 1,	By paid	Bryant Council	$ 12 50
15.	2,	" "	S. E. Parkill	200 00
15.	3,	" "	W. L. White	50 00
15.	4,	" "	Mart Timmes	5 00
Nov. 30.	5,	" "	Owosso *Press*	17 50
30.	6,	" "	Calvert Lithograph Co	10 00
30.	7,	" "	*Times* Printing Co.	4 00
1887.				
Jan. 13.	8,	" "	J. S. Harrison	50 00
20.	9,	" "	H. J. Brown	22 00
Feb. 18.	10,	" "	D. O. Haynes & Co.	47 25
Mch. 5.	11,	" "	W. P. Holliday	1 25
April 22.	12,	" "	*Times* Printing Co.	3 50
23.	13,	" "	D. O. Haynes & Co.	189 32
May 26.	14,	" "	Frank Wells	8 00
July 12.	15,	" "	S. E. Parkill	121 45
				$ 741 77
	Balance on hand			523 31
				$1,265 08

RECAPITULATION.

1886.	RECEIPTS.		
Oct. 15.	Balance on hand	$ 518 38	
	Amount received since	746 70	
			$1,265 08

1886-7.	DISBURSEMENTS.		
	Amount paid out	$ 741 77	
	Balance on hand	523 31	
			$1,265 08

Respectfully submitted,

WM. DUPONT, *Treasurer.*

THE PRESIDENT—The report of the Treasurer will also be referred to the Executive Committee. The report of the Legislative Committee is now in order.

Mr. WELLS—The Legislative Committee were obliged to go over very much the same ground the President went over in his address, but we have prepared a brief report, which I will read.

REPORT OF LEGISLATIVE COMMITTEE.

To the President and Members of the Michigan State Pharmaceutical Association.

Your Committee have nothing to report concerning legislation in other States. This has become known to most of you through the periodical press devoted to our interests, and, as it possesses but little interest for us, we shall have nothing to say of legislation outside our own State.

Three acts passed by the Michigan Legislature at its recent session are of special importance to our Association and to pharmacy. The act providing for the incorporation of a State Pharmaceutical Association, passed for the purpose of enabling our Association to re-organize as an incorporate body, is of great importance to us. The new organization will have a legal status and character which the present has not. Recognition by the Legislature in future legislation and by other associations, both outside and within our State, together with representation upon the committee for the revision of the Pharmacopeia, are among the advantages secured to us by re-organizing under this law. The transformation to a legal body may be accomplished during the present session, and need necessarily involve no change in our organic or by-laws, or the loss of a single member whom we may desire to retain.

A bill introduced early in the session by Mr. McKie to amend the pharmacy law had for its sole object the admission to registration without examination of a few pharmacists who were in business when the pharmacy law went into effect, but who failed to avail themselves of the privilege of registering at that time This, although unjust to the large body of druggists who complied with the law and have continued to do so by paying their annual registration fee, affected so small a number that it was deemed wise to add some needed amendmennts to it and let it pass than to contest it. Although experience had demonstrated the importance of these amendments, it had been decided not to ask them at this time. They consist in the abolition of the provision in Section 10, which permits any retail dealer engaged in business at a distance of not less than five miles from the limits of any incorporated village or city to sell medicines of any kind without restriction, and for the registration of assistants in pharmacy. Both amendments are important—the first, in

preventing fraud and in giving the same protection to those outside as to those who reside within villages and cities; the second, in providing a remedy for an oversight in the law, which made no provision for the registration of assistants in pharmacy, except such as were in business when the law went into effect. Under this latter amendment, the examinations by the Board of this class will presumably be below the standard required for pharmacists, but will, at the same time, be sufficiently rigid to secure competent clerks. With these changes the pharmacy law of Michigan seems to contain all the provisions necessary for the protection of her citizens against incompetency, while permitting such of them as live at a distance from a registered pharmacist to purchase at the country store all ordinary family medicines. It is free from those two objections which impair the value of the laws of several States—the registration without examination of physicians and of graduates from colleges of pharmacy. It is, without doubt, as nearly perfect as present knowledge and experience can make it.

It has been proposed to legislate upon the liquor traffic, which has excited most attention from pharmacists, and the probable effect of such legislation upon the interests of pharmacy has been under continual consideration by this committee during all the latter part of the session. The strong temperance sentiment which the vote upon the prohibitory amendment developed, led to secret party caucuses, where it was decided to pass a liquor law which should largely increase the tax which dealers were compelled to pay, make the penalties for violation of the law more severe and include druggists in its stringent provisions. Immediately upon their occurrence these facts came to the knowledge of the committee, who requested a number of prominent druggists to meet at Lansing to consider the situation and take such action as they should deem expedient. The request was responded to promptly, and over twenty of the representative druggists of Michigan came to Lansing to express in some emphatic manner their indignation at being classed by their own State with the dram shop. A vigorous memorial and resolutions were prepared and presented to the Legislature, protesting against the contemplated action and pointing out a method for accomplishing the object desired without subjecting druggists doing a legitimate business to either the odious classification or the tax. Personal appeals and arguments were also largely made use of by these gentlemen with members. The result of this meeting, and of a similar one called subsequently by President Wurzburg, was that the measure known as the Bates bill, containing no exemption in favor of druggists, was modified by the Diekema amendment, which excludes them from both the tax and penalties. The discussion upon this bill in the House was listened to by a large number of druggists, who will probably not soon forget the virulent and untruthful statements made by many of the members of the number of druggists engaged in the illegal traffic in liquor. Even the Speaker of the House, with an unfairness unbecoming his official position, stated that he

supported the amendment relieving druggists from the tax solely because he believed the bill could not be passed without it, and *not* because druggists were entitled to this exemption, for he was confident that ninety-nine out of every hundred sold liquor illegally. Mr. Diekema, at first disposed to have druggists included in the tax, supported his amendment with a skill and force that secured its passage. He was ably supported by Doctors Bardwell and Baker, Mr McMillan, Mr. Damon, Mr. Hunt, Mr. Rumsey and many others. Our Association and the druggists of the State, generally, are greatly indebted to these gentlemen for the efforts made by them in our defence, and their success in preventing the infliction upon us of a great wrong.

The outcome of this liquor legislation in its bearing upon the drug trade should be entirely satisfactory to every honest pharmacist. The few changes from the old law were all suggested by the druggists who attended the meetings at Lansing. The principal ones are that no liquors shall be mixed with any beverage drawn from a soda fountain, or drunk upon the premises under any circumstances, and a penalty of revocation of registration for the space of one year for conviction for a second offence under the law. These will have no terrors for the pharmacist who desires to sell liquors for those purposes only which he is permitted to by the law. This class, we believe, constitutes a very large majority of the pharmacists of Michigan. The small minority who prostitute our honorable profession to minister in their selfish greed to one of the most debasing appetites of human nature should not only be classed in law and in public estimation with the dram shop and the saloon, but they should also be compelled to pay the large tax which the Legislature has rightly imposed upon those who follow this ignoble calling. Nothing connected with their special duties has been so gratifying to the committee, as were the earnest and unanimous expressions of our brethren who met with us at Lansing, that not only should honest druggists be exempt from the liquor dealers' tax and reputation, but that the saloon keeper who plies his vocation under our banner should be made to suffer the penalty of his hypocrisy and to appear in his true colors. It indicates that we are beginning to realize the fact that a moiety of our number has been creating an unsavory reputation for the whole and that it behooves each one of us to the best of our ability, by example and by every other means, to disabuse the public mind of the fallacy that because druggists must keep and sell liquors they are necessarily saloon keepers. In compensation for this knowledge is the recent achievement, through the moral power of our Association, of compelling men to relinquish their prejudices and recognize us as a body of honorable merchants, whose business and professional character entitle them to the respect of all honest and intelligent men.

To the President, Mr. Wurzburg, and to the gentlemen who freely gave their time and energy to aid us at a critical period, the thanks of the Association, as well as our own are due. Such prompt, intelligent, and

effective action is a sure index that the time is not far distant when the character and influence of our Association will be such that neither officers nor members of our Legislature will have the temerity to speak insultingly of the pharmacists of Michigan.

FRANK WELLS,
JOHN E. PECK,
JACOB JESSON,
Committee on Legislation.

Prof. PRESCOTT—I move that the report of the committee be adopted.

Mr. DUPONT—I would like to add to the motion that the thanks of this Association be given to Mr. Wells for his work, vigilance and untiring effort in our behalf.

Prof. PRESCOTT—I accept the suggestion.

Carried.

Mr. WELLS—Mr. President, I thank the Association very much for this expression of appreciation of the little work I did. I am sorry it could not have been more.

Mr. Brown offered the following report of the Committee on the President's address:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The first item in the address to which the attention of the committee was called was the matter of local organization, and the committee feel that the Association is to be congratulated upon the success of the plan which was adopted by the Association and carried out by the President and Secretary. We feel that the formation of fourteen new societies as the fruit of that plan is a result which entitles it to the hearty endorsement of the Association, and the committee would approve the President's recommendation that the plan be continued for another year.

The next item to which attention was called was the matter of the price list which has been compiled by the local association of Grand Rapids; the committee would recommend, in accordance with the President's suggestion, that other local associations procure copies of the list for a guide to themselves in matters of that sort. It would be much cheaper for any

local association to do that than to prepare a list for itself, inasmuch as it is already published.

The committee approves also the recommendation that the Association appoint or elect a representative or representatives on the committee for the revision of the Pharmacopœia.

The committee approve the recommendation of the President that copies of the proceedings be mailed only to those members of the Association who are less than two years in arrears for dues.

In regard to the recommendation made by the President that the Association return to the original intent of the law in regard to the appointment of the members of the State Board of Pharmacy, the committee beg leave to say that the law as enacted does not contemplate any such action on the part of this Association. It does not give this Association the privilege, as we understand it, of making any such recommendations. The committee are not unmindful of the fact that the law, as originally framed and as reported to this Association and adopted by it, did provide that the society should from year to year recommend certain persons to the Governor from whom he should make his appointments. The Committee on Legislation, however, who had the matter of securing the enactment of the law in charge, were granted leave to make such changes as they might find necessary, and one of the changes they found to be necessary was the changing of that arrangement. It was found among other associations where a similar plan had been pursued, that as a matter of fact the Governor ignored entirely the recommendations, and that any law making it mandatory on the Governor to make his appointments from such names as were sent to him from an Association like ours, would be regarded in this State as infringement of the executive power, which no Governor would be likely to yield to. It is therefore thought by the committee to be wiser for us at this time not to take action in regard to this matter.

The committee heartily endorse the sentiment expressed in the President's address in regard to the traffic in liquors, and only wish they had the wisdom to devise some practical

plan for solving this perplexing question, or could suggest some law that would wipe out this disgrace upon the profession of pharmacy, but the committee has not that wisdom, and we therefore present no such recommendation.

Last of all, the committee approve the recommendation of the President that when the Association adjourns at this session we take an adjournment *sine die*, in order that when we meet to-morrow we may reorganize under the Act of Incorporation which has been secured for us.

H. J. BROWN,
A. BASSETT,
G. C. STEKETEE,
Committee.

On motion the recommendations of the committee were taken up *seriatim* for consideration, and were concurred in without debate, except upon a single topic. Action with regard to the appointment of delegates to the convention for revising the Pharmacopœia, was deferred until after reorganization of the Association.

With regard to the propriety of recommending to the Governor candidates for appointment on the State Board of Pharmacy, there was considerable divergence of opinion. Mr. Vernor thought that the Association had as much right as any private individual to make such recommendations, and their recommendations ought to have more weight than those of any private individual, as being less liable to be influenced by personal considerations.

Mr. Crouter thought that as the State Board of Pharmacy owes its existence to our Association, it is only right that we should have the privilege of choosing fit men to serve the State in that capacity. Of course, under the law, our recommendations would not be mandatory, but they ought to be influential.

Mr. Wells regarded the question one simply of expediency. As a matter of fact our Governors are very jealous of their prerogative and pay no attention to suggestions such as it is proposed to offer gratuitously. It would be humiliating to offer a recommendation merely to have it ignored. We have certainly no fault to find with the appointments that have been made hitherto.

Prof. Prescott stated that strong objections were made on the part of the Judiciary Committee of the Legislature to the provision in the original draft of our pharmacy bill for nomination to the Governor by our Association of candidates for appointment. There is certainly a strong prejudice in this State against such a practice. It seems unreasonable, but since it exists, it is probably wise for us to respect it.

Prof. Stevens regretted that important appointments should be intrusted to men so wholly unqualified for making judicious selections as some of our Governors have been. Fortunately they have made good selections hitherto for this particular office. The Association certainly ought to have a voice in the appointment of a board which practically controls our profession. Under our law we have no express right to make recommendations, but the law should be amended.

Mr. McDonald said that every effort had been made to retain the original provision, but in vain. It was urged that the expenses of the State Board of Pharmacy were not paid by the State at large, but by the druggists, but argument was useless.

Mr. Brown said that if we had insisted on that provision we should have had no Pharmacy Law at all.

Mr. Crouter reiterated his conviction that a recommendation coming from such a body as ours must have weight with any intelligent Governor. There is certainly no impropriety in our making such recommendations, and it is so clearly our right that no Governor of any intelligence could take any offense; he would, rather, be grateful for advice from such a source.

Mr. Eberbach believed that the peculiar relations of the Board of Pharmacy to our Association would justify us in making nominations. The Board is required by law to report to the Association, and, in fact, all their doings are watched and guarded by this Association. We should be allowed opportunity to present several names of men well qualified to become members of the State Board, and bring them properly before the Governor, either through our Legislative Committee, or through some other committee we may appoint. He

believed that the Governor would pay attention to such an application, and if he should, it would put the Board in a position where it could do the most good, and it would have the hearty support and sympathy of the druggists.

Mr. Bassett was inclined to agree with the last speaker, but unfortunately, he said, our Governors and legislators are men possessed of prejudices, and one of the prejudices which is the deepest seated of all, that extends clear down to the soles of their feet, is a fear that somebody will interfere with their right to do something. We have been denied a law giving us the right to make recommendations. Shall we submit ourselves to the gratuitous humiliation of asking a favor, which, simply because it is asked, is likely to be refused? There is no objection to selecting a candidate, getting up a petition, and presenting it to the Governor with our signatures as individuals; if the petition were disregarded, our pride would not be wounded, and we should have accomplished as much as though we had offered the nomination as coming from the Association.

The recommendation of the committee that no action be taken in the matter was finally adopted.

Mr. Wells—I desire to state that I have a communication from the Harbor Point Association, cordially inviting the members of this Association to visit the hotel grounds and places of amusement at Harbor Point while we are in this vicinity, and that it will give the Association pleasure to do all in its power towards entertaining our members during our visit here. I would say it is one of the most delightful resorts in northern Michigan, and that it can be reached by rail or boat, and if the members will go over there they will be cordially received.

Mr. Dupont—I think we are here for that purpose, and therefore, I move that we accept the invitation with thanks.

Which motion was unanimously carried.

Mr. Wells, in behalf of the committee appointed for that purpose, submitted a constitution and by-laws for the re-organized Association, identical in the most of its clauses with that hitherto in force.

On motion of Prof. Stevens, the Association proceeded to consider such sections of the new constitution and by-laws as differed from the old.

Mr. WELLS—In Article 4 of the Constitution we have adopted the suggestion made at the last meeting at Grand Rapids, changing the phraseology slightly, that the officers of this Association shall be a President, three Vice Presidents, a Secretary, an Assistant Secretary to be selected from the place where the next meeting is held, a Treasurer, an Executive Committee of five persons, all of whom shall be elected by ballot at the third session of the Association. The principal change is that the election of officers shall take place at the third session of the regular meeting.

Sec. 2, Article 5, has been changed so that the last clause shall read as follows: "The Secretary shall file and keep the proceedings of each annual meeting in the office of the State Board of Health, and also in the office of the Secretary of State, and shall keep at least three copies in his own office."

Article 10 of the By-laws is amended to read as follows: "Any member or officer accused of violating the Constitution or By-laws, or of other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting. In every case definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the charges, and notify him in writing, at least two weeks in advance, of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense."

In Article 12 of the By-laws, the order of business is omitted. It is left to the Executive Committee to decide at each annual meeting what the order of business will be. We do that because we always omit the calling of the roll and the reading of the minutes.

On motion, the Constitution and By-laws submitted by the committee were approved.

A report was called for from the Michigan member of the Unofficial Formulary. Prof. Stevens made a verbal report, giving a sketch of the work that has been done by the general committee up to the present time. He had himself communicated with several local medical and pharmaceutical societies, with a view of obtaining from them assistance in this work. From several of these Societies he had heard nothing. The Detroit Academy of Medicine, a medical society, devoted a good portion of an evening to a discussion of the subject, but decided that the work was one that should be left in the hands of the pharmacists, as physicians themselves had all they could attend to of matters concerning their own profession.

The committee is now engaged in making a critical examination of the several preparations recommended in the preliminary draft for a formulary, the reports of its numerous individual members to be collected by the first of August, to be incorporated into a general report, which will be submitted to the meeting of the American Pharmaceutical Association at Cincinnati.

THE PRESIDENT—We shall be pleased now to hear from the delegate from the Ohio Association, Mr. S. E. Allen, whom I have the honor of introducing.

Mr. ALLEN—Mr. President, Ladies and Gentlemen of the Michigan State Pharmaceutical Association: I shall carry away with me none but agreeable memories of this meeting. From the start, my trip has been one of the most enjoyable I ever made; it is doubly pleasant to me from the fact that I come as a delegate from the Ohio Association, and trebly pleasant because I come at your urgent invitation. The lake trip, if one can overlook a few unpleasant incidents, is one of the most delightful that can be made, and I can readily understand why you have had your meeting in this, one of the most delightful spots in Michigan. I have often heard of Petoskey as one of the pleasantest summer resorts upon the lakes, and its reputation is well founded. I shall say when I go back to my friends in Ohio, that if they ever come to Petoskey they must certainly come by the same route we did, not omitting the *Inland Route.*

THE PRESIDENT—Are the delegates to the Ohio Association ready to report?

Dr. LYONS—I was not one of the regularly appointed delegates to the Ohio Association, but as it was convenient for me to attend their meeting, I was authorized by our President and Secretary to bear the greetings of our Association to theirs, and I was glad of the opportunity to make the acquaintance of some of our Ohio brethren. There are some things about travel by water, as our friend Allen says, that are not altogether agreeable. In my own case I took the Cleveland steamer at ten o'clock on a beautiful still June evening, looking forward to a delightful moonlight ride over the lake. Half an hour after we cast off from the dock we were anchored in the middle of Detroit River in a fog, and there we remained until 7 o'clock the next morning. In that way I missed the first day's meeting of the Association, much to my regret.

Arriving at that very pretty and enterprising town, Akron, where the meeting was in full session, I found a warm greeting from the members of the Association, and a more cordial and whole souled body of men, apart from their professional or business character as druggists, I think you would find nowhere.

Of the meeting itself I have little to say. The business of the meeting was conducted with great promptitude; everything as far as possible was put into the hands of committees. Papers were always forthcoming the moment there was a lull in the proceedings, and being read in abstract, they were all put in and made intelligible to those interested in them, without consuming too much time. This method of epitomizing the papers so that the reading of them should not become in any way tedious, seemed to me worthy of adoption. Among the papers presented, the one which attracted most attention was that of Prof. Lloyd, which has been since published in several different journals, and which I was sorry was not more fully discussed in the meeting. The paper was entitled: "The Handwriting on the wall." The drift of the paper, and I may say that it has been the drift of a good many papers read before

different pharmaceutical Associations this year, was to the effect that druggists must recognize the fact that pharmacy is changing rapidly; that old methods of doing business are passing away, and new ones coming in, and we must be prepared to fold our tents and move on; the last suggestion of the paper was that there was no help for it, that we are liable to become old fogies and be left behind in the progress of our art unless we keep abreast of the times. I cannot wholly sympathize with this conclusion. I am not ready to admit that the shaping of our destinies is wholly in the hands of a certain few, viz: those who call themselves the manufacturing chemists. It is one object, it seems to me, of associations like ours, to see what can be done towards shaping ourselves the future of our profession, and there is no reason why we should not do this in as progressive and aggressive a spirit as those manufacturers who try to arrogate to themselves all the credit of the advances that are making in our art. Of this, perhaps, more at some other time. At present I have only to say further that the druggists of Ohio, if they are to be judged by the meeting in Akron, are as jovial a set, as free in their hospitality, and as hearty in their welcome as any class of men I ever met.

THE PRESIDENT—Mr. Steketee attended the Indiana meeting as our delegate. We shall be glad to hear from him.

Mr. STEKETEE—I was appointed to attend the Indiana State Association and I was well received. There were but a few present and there was nothing of any importance occurring when I was there: The Pharmacy Bill which was under consideration took up the most of their time.

On motion the reports of the delegates were accepted.

THE PRESIDENT—The report of the Committee on Michigan School of Pharmacy is in order. Is any member of that committee present?

THE SECRETARY—None of the members of that committee are here.

THE PRESIDENT—The Committee on Adulterations.

Dr. LYONS—I believe I am the Chairman of that committee. The committee has no report to offer as no work has been done, so far as I know, during the year.

Prof. PRESCOTT—I would ask the attention of the Association to a paper upon "The Strength and Purity of Spirit of Nitrous Ether." The work on this paper was done on the advice of Prof. Stevens, who will read the paper, the party who prepared it not being present.

Prof. PRESCOTT—Mr. C. E. Foote will now read a paper in answer to Query 25: "Does the present Pharmacopœial Formula for Syrup of the Phosphates of Iron, Quinine and Strychnine yield a satisfactory product?"

Prof. PRESCOTT—We will now call upon Mr. McDonald for a paper upon the Query: "How does the Spirit of Camphor used in filling physicians' prescriptions compare in strength with the present pharmacopœial requirements?"

For these papers see subsequent pages.

Dr. Dunlop. of Clare, a member of the Central Michigan Association, who had made the trip from Ludington to Petoskey in a yacht, accompanied by F. N. Latimer, of Ludington, Dr. Short, of Manistee, and other prominent druggists from that section of the State, now read a humorous versified narrative of their voyage and its adventures, entitled "The cruise of the Norden," which was received with applause, and the Association afterwards adjourned *sine die*..

THIRD SESSION.

WEDNESDAY MORNING, JULY 13.

At 10 o'clock the members of the old Association assembled in Mitchell Hall. Mr. Wells stated that the object of the meeting was to organize an Incorporated Association under the Act passed at the last session of the Legislature. He moved that Mr. Frank Wurzburg act as Chairman of the meeting.

Carried.

Mr. WURZBURG—I thank you, gentlemen, for the honor conferred upon me, and I bespeak for the new Association the same success the old Association has enjoyed.

On motion of Mr. Wells, Mr. Stanley E. Parkill was elected Secretary.

MR. WELLS—I move that a committee of three be appointed to report a Constitution and By-laws to this Association.

Carried.

THE CHAIRMAN—I will appoint as such committee Mr. Wells, Mr. Jesson and Mr. Peck.

Mr. WELLS—Mr. Chairman, the committee is ready to report. The Constitution and By-laws which I hold in my hand are the same as the Constitution and By-laws of the old Michigan State Pharmaceutical Association, with which many of you are familiar, with a few alterations which have met the approval both of your committee and of others to whom it has been mitted. I now move that this Constitution and By-laws be accepted and adopted, and that we now form a State Pharmaceutical Association under that Constitution and those By-laws.

The motion prevailed.

Mr. WELLS—I would state that attached to this Constitution are the names of the gentlemen who were present here yesterday and have signed the register. We have considered that this would meet with their approval, while members of the old Association present who have not signed can now attach their names to the new articles. If this method is unsatisfactory to any who have signed the register, it will be proper for them to state it now. In the absence of any expression to the contrary from them, we see no objection to this meeting considering that they have shown a willingness to have their names attached to the Constitution and By-laws the same as if they had signed in person.

Mr. BROWN—I move that the Secretary be authorized to transfer the names of all members of the old Michigan State Pharmaceutical Association in good standing to the register of the new Association.

Carried.

Mr. JESSON—I would like to state that the new Association starts out with a membership of 792.

On motion, Messrs. S. H. Douglass of Ann Arbor, G. P. Englehard of Chicago, Ill., S. S. Garrigues, Ann Arbor, T. J. Wrampelmeier and H. LeCaron, Braidwood, Ill., were elected honorary members of the Association.

Mr. WELLS—I move that we now proceed to the election of a President of the Association for the coming year, the term of his office to commence with the close of this meeting.

Carried.

THE CHAIRMAN—I will appoint as tellers Mr. Webb of Jackson and Mr. Lamoreaux of Lake View.

Mr. VERNOR—I would like to call the attention of this Association to a man known to you all, as a candidate for the office of President. A man who gives his time freely, and whose only fault is that he is prone to be a little severe on traveling men. I think it is hardly necessary for me to name him, but I will. His name is Arthur Bassett, of Detroit.

Mr. CROUTER—I would like to name another Detroit man as a candidate for President, one who has been with us at every meeting of our Association, who is president of the Detroit Association, and I commend his name to your consideration, Mr. Frank Inglis.

Mr. BASSETT—Mr. Vernor very frequently gives me an unkind cut, which seems to give you a great deal of pleasure. I do not understand the reason why, for we have always been very good friends, but it seems to me "this is the most unkindest cut of all." It was entirely unexpected to me. I have never contemplated any such thing and I should very much like to withdraw my name in favor of Mr. Inglis. I think he is much better suited for the nomination, and I would like to see him have it.

Mr. WELLS—There are several applications here for membership and I would state that I think those who have applied for membership have as good a right to vote as any of us. After the adjournment last night there was no organization, and when we met here this morning it was just as a meeting of gen-

tlemen to organize a new Association. These gentlemen came in here and should have the same right to vote, I think, as any of us who have paid our fee.

THE CHAIRMAN—Those gentlemen who put in their applications for membership this morning are entitled to vote.

On the vote being taken the tellers made the following announcement: Whole number of votes cast, 71; 43 being for Mr. Bassett, 25 for Mr. Inglis and 3 scattering, and the Chair declared Mr. Bassett duly elected.

On motion, the Association proceeded to the nomination and election of a Secretary, whose duties were to commence at once.

Stanley E. Parkill was nominated by Mr. Wells, and on motion of Mr. McMillan, there being no other nomination for the office, the rules were suspended, and Mr. Parkill was declared unanimously elected.

THE CHAIRMAN—Nominations are now in order for the three Vice Presidents.

The following gentlemen were nominated: Guy M. Harwood, of Petoskey; Henry Kephart, of Berrien Springs; A. H. Lyman, of Manistee, and H. B. Fairchild, of Grand Rapids.

On motion of Mr. Wells it was decided that the three candidates receiving the highest number of votes should be elected Vice Presidents.

On motion of Mr. Gundrum it was resolved that if any ballot contained the name of the same person more than once, the ballot be rejected.

The tellers announced that Mr. Harwood received 60 votes, Mr. Lyman 45, Mr. Fairchild 49, Mr. Kephart 48, scattering 2. which leaves Mr. Harwood with the highest number of votes, Mr. Fairchild second, Mr. Kephart third.

THE CHAIRMAN—I declare those gentlemen elected as reported by the tellers.

Mr. WELLS—I will nominate for the office of Treasurer Mr. William Dupont, and I would move that the rules be suspended

and the Secretary be instructed to cast the ballot of this Association for Mr. Dupont as Treasurer for the coming year.

Which motion prevailed.

Mr. DUPONT—I think I ought to decline this time.

Cries of "sit down, sit down. Speech, speech."

The Chairman then declared Mr. Dupont duly elected Treasurer of the Association.

The Association proceeded to ballot for the five members of the Executive Committee with the following result: Geo. Gundrum, of Ionia, Chairman; Frank Inglis, of Detroit; A. H. Lyman, of Manistee; J. E. Peck, of Grand Rapids and E. T. Webb, of Jackson. After some debate, Detroit was chosen as the place for the next annual meeting of the Association, which will hold its first session on the second Tuesday in October, 1888.

Mr. James Vernor was nominated for local Secretary, and on motion the rules were suspended and he was declared elected.

As delegates to the Cincinnati meeting of the American Pharmaceutical Association, the following gentlemen were elected: Dr. A. B. Lyons, William Dupont, A. B. Stevens, C. G. Stone and George Gundrum. Alternates: Stanley E. Parkill, Frank Inglis, O. Eberbach, J. Lamoreaux, Lake View; Mr. F. N. Latimer, Ludington.

As delegates to the meeting of the American Pharmaceutical Association in 1888: Prof. Prescott, C. H. Wagener, Dr. A. B. Lyons, W. A. Hall and R. S. Latimer, of Jackson. Alternates: F. J. Wurzburg, Frank Wells, A. B. Stevens, Jacob Jesson and E. T. Webb.

The Chairman announced the following committees: On Exhibits, C. A. Bugbee, H. B. Fairchild, Frank Inglis, A. H. Lyman, H. Kephart. On Memorial Resolutions, Messrs. Lamoreaux, Wagener and Webb.

THE CHAIRMAN—The committee on the President's address recommended the selection of representatives to the Convention for the revision of the Pharmacopœia.

MR. JESSON—As that meeting does not occur until 1889, I think we had better defer action.

THE CHAIRMAN—I think it had better be deferred.

DR. LYONS—As there seems to be a moment for the transaction of miscellaneous business, I desire to present a name for election to honorary membership in this Association, that of a gentleman who, although not now actively engaged in the practice of pharmacy, has long held a place of distinction among the pharmacists of our State and maintains his interest in everything pertaining to chemistry and pharmacy, Dr. S. P. Duffield, who is now Health Officer of Detroit.

The motion was supported by Prof. Prescott, and Dr. Duffield was duly elected an honorary member.

THE CHAIRMAN—If there are any members present who were committees on local organizations we would like to hear from them.

MR. BUGBEE—I was appointed in Cheboygan county to perfect a local organization, and I desire to say that I failed to organize the county, but I think I can say that it was not my fault. I wrote to every druggist in Cheboygan county asking his opinion as to an organization, and in reply I received a letter from Mr. Hackett, of Wolverine, which was the only reply I did receive. After waiting a week I called a meeting of all the druggists of Cheboygan for a certain date for the purpose of forming a local organization. I wrote to every druggist in the county and visited every druggist in Cheboygan, urging them to organize, and sought to explain to them the advantages of such an organization. I also wrote to Mr. Escott of Grand Rapids for price lists, etc. At that meeting Frank E. Brackett of Cheboygan and myself were the only ones present. I wish to say that I am considerably discouraged and have not made any effort since that time. The druggists in that region seem to be indifferent to the subject and seemingly act upon the theory of each one taking care of himself and the devil take the hindmost.

THE CHAIRMAN—Is the Committee on Trade Interests ready to report?

MR. BASSETT—The committee has no written report to submit, since it is almost impossible to formulate a report upon the

various questions that are brought before this committee. The first subject we have to present to the Association for discussion is that of a mutual insurance organization, and to set the ball rolling I will read a letter received from Mr. Hibbard, the gentleman who agitated the question last year:

MUTUAL FIRE INSURANCE AT REASONABLE RATES.

Not being able to attend your meeting, and having been one of the first to suggest a Druggists' Mutual Insurance Association for the State of Michigan, allow me to draw a comparison:

We are obliged to pay 5% for Insurance, which, on a $2,000 policy, would cost $100 per year in a Stock Company. In case of total loss, a Mutual Company of *twenty members* assessed at 5% would pay the loss. Forty members at 2½% would pay the loss. Eighty members at 1¼% would pay the loss. One hundred and sixty members, ⅛ of 1%. Three hundred and twenty members ¼ of 1%, etc., etc. Our Association numbers eight hundred. Were they all members of a Mutual Company the expense of Fire Insurance would be nominal. The State contains 3,000 druggists. If two-thirds of them belonged to a Mutual Company, $1.00 each sets your brother druggist on his feet again, and at the same time sets the monopoly of underwriters to seeking pastures new. At Stock Company rates, a 5% assessment on such a company would pay a loss of $200,000, or in other words, it would reimburse two hundred retail druggists at $2,000 each, in case of fire. At present Stock Company rates, 5%, we are paying into the hands of Eastern monopolists enough to reimburse two hundred fellow-sufferers each year, while we do not suffer a loss of 20 stocks of goods by fire. Can we afford it?

FRANK HIBBARD.

Evart, July 11th.

Mr. Bassett—I think the majority of the members will bear me out in saying that Mr. Hibbard has overdrawn the facts. While there may be some druggists in the State paying as high as five per cent. for their insurance, I feel satisfied that it is a very small number. I would like to have this question taken up by the Association and discussed, and let them take such action as they like.

Mr. Wells—I would like to inquire of Mr. Bassett if he has any information regarding the action taken by the Wholesale Druggists' Association? I believe that at their last session they took some action upon this matter.

Mr. BASSETT—I called upon Mr. T. H. Hinchman to get the facts in regard to the wholesalers' action, but I was unable to obtain an interview with him, and therefore have no facts and figures to present upon that point.

Mr. LAMOREAUX—In country towns where the buildings are of wood, five per cent. is not a high rate of insurance. In our town, on the east side of the street, they pay five and a half per cent., and on the west side six per cent., and I think you will find that five per cent. is not a high estimate in small towns.

Mr. DEAN—At Niles we pay 1½ per cent. in the stock companies.

Mr. WELLS—The wholesale druggists have this matter under consideration, and I think we had better watch the result of their efforts. I think it is quite probable we are coming to this, however, that mutual insurance is the way out of the high rates we are paying. We are not only paying high rates, but we are subject to the dictation of a board which usually consists of a single individual, who dictates rates in the district where he is appointed, and he may not always be influenced by the best motives. Where mutual insurance can be properly conducted it is the right kind of insurance. You cannot expect to get mutual insurance without paying something in addition to the cost of carrying the risk, in the way of salaries of clerks and others to look after the risks, to see that they are properly rated, and also, as they do in Massachusetts, to see if the buildings are properly protected from fire. I think, therefore, we had better postpone the subject.

Mr. FAIRCHILD—The wholesalers have organized and are only waiting to get a sinking fund of $50,000, which is being rapidly subscribed. I have the papers at home which will give the data required, I will telegraph for them and they will be here to-morrow morning.

Mr. BASSETT—The next question is, as to the retailing of goods by wholesalers. The President in his address recommended that action be taken on this question, and turned it over to the Committee on Trade Interests. The Committee on

Trade Interests have considered the question, and I must say it was too much for us, and we desire to turn it over to the Association.

Mr. PECK—I do not think there is any possible objection to wholesalers retailing, if they will only consent to sustain the retail prices, but it is an imposition on the retailer for the wholesaler to retail at cut prices, and I suppose that is the objection to wholesalers retailing. I presume there is hardly a wholesaler in the country, and especially in the Eastern cities, who does not retail at the customary retail prices.

Mr. DEAN—I think this whole matter will regulate itself.

THE CHAIRMAN—I think the best way of regulating it is through the local organizations.

Mr. BASSETT—The next question is the selling of drugs by wholesalers to physicians.

Mr. PARKILL—I sent out notices to the wholesale dealers upon this subject, and almost without exception I received a reply that they never sell to physicians at all except it be some article they can not get otherwise or unless they are remote from a drug store.

Prof. STEVENS—I think I can testify that that is false. In the City of Detroit I know that wholesale houses do sell to physicians.

Mr. NOEL—Several years ago I had a denial from a wholesale house that it sold drugs to physicians, but to my knowledge a physician I was selling to continuously bought, I believe, $125 worth at one time.

Mr. BASSETT—The next question before this committee is "Needed Legislation." I will state that what calls forth this question is the agitation during the last session of the legislature of the question of taxing druggists, and I for one feel it is a very serious question, one which should be taken hold of with an idea of remedying it, and I believe we can find some means by which we can escape the trouble, the annoyance and insults we have been put to during the last session.

Mr. DEAN—I feel that the Association should give to the pharmacists of this State a very strong paper on the subject

of retailing of whiskey by druggists. Unless we stop this retailing of liquor, it will bring a heavy tax upon us. The charge that druggists make saloons of their places of business has some foundation in fact. I am happy to say in our section we are free from it, but I know complaints come from other towns, and I regret to say it is true in the northern part of the State. I wish it could be wiped out, and I hope before the Association adjourns it will present a strong paper to the State showing why they should abstain from it not only as a matter of pride, but as a matter of dollars and cents, because we shall certainly be taxed unless it is stopped.

Mr. NOEL—I do not think there will be any difficulty in this Association taking some action. According to my observation, however, the whiskey selling druggists are not members of this Association. There are undoubtedly druggists in the State who ought to pay a whiskey license as saloonists, and their drug privileges should be taken away from them.

Mr. BASSETT—Mr. Chairman and Gentlemen, I would like to say something on this subject, but I confess freely that I am too angry to talk on the subject. My ears still tingle with the sentences I heard in Lansing last winter. I have not been so angry for a long time as I was at the expressions put forth on that floor. It has occurred to me, though, that it was possible for this Association to find a way out of this difficulty something in this manner. There can be no question whatever in our minds that there are men in the State of Michigan who prostitute the drug trade to the selling of liquor. They cloak a saloon under a drug license or a drug sign. Now then, those men in Lansing had some reason for their utterances, although they were extremely radical and untruthful. It seems to me it would be well for this Association to appoint a standing committee for the year, whose duty it should be to require or request the druggists in the different parts of the State who are members of this Association to report to them any cases they may discover of druggists who are selling liquor by the drink. The report may be made to this committee and the name of the informant be suppressed, but let him report facts enough to convict the man. Then let this committee institute proceed-

ings against this man and bring him under the State tax as a saloon keeper, and make him pay the tax. In this way we shall show the people of the State that we do not intend to be classed as saloon keepers, and that we are not saloon keepers. The better part of the trade are opposed to it, and we are liable to be subject to this wrangling in Lansing and these charges, so long as we allow our skirts to be bedraggled with this sort of thing. We have a State law and the only thing necessary is to enforce it. If the local State officers will not enforce the law, let us do it, and let us put all the machinery we have in force to this end. If I remember rightly the law passed last winter provides an additional penalty, revoking their license as druggists, and when we have revoked their right as druggists we shall have put them where they belong, among the saloon keepers.

Prof. PRESCOTT—It is very evident that it is of importance that this subject should be put in its proper light by this Association before the people of the State. We have a drug service in this State, and in our civilized life the people cannot do without it. We have the business of pharmacy which is indispensable in pharmacy. Now, shall the pharmacist be degraded to the position of saloon keeper or not? There are two classes of measures which the State may institute. One is to put the pharmacist in the same category with saloonists and under the same regulations, taxing them the same as the saloonist and placing them under the same restrictions; and the other is to put restrictions upon the pharmacist becoming a saloonist, taking away his commission as such in case he violates it. The last proposition is the one that seems the method of common sense, and was the one urged by our committee in the legislature this year, the one we may bring before the people and impress upon them that druggists cannot afford to degrade the business of pharmacy in this State. It is not alone the liquor interest that is concerned; it is an entire profession, a profession which is intrusted with the lives of the citizens, that is at stake. It cannot be possible that pharmacists can be placed in the same category with saloonists without gradually degrading and injuring the business of pharmacy as a pursuit impairing

its service in furnishing remedies to the people. It seems to me that the propositions of Mr. Bassett are eminently reasonable. They are just in line with what has already been proposed. We would all work very heartily in support of that section of the President's address, and of the report of Mr. Wells on that subject. There is but one idea in this Association upon the question, but some work must be done in carrying it out and getting it before the people. Laws do not enforce themselves, but must be enforced by those who put their hands to it. Any one can do it; volunteer workers can call for the enforcement of the laws, and while it will take some work to do it, I do not think this Association could be any better employed than in seeing that druggists generally in the State do not grossly violate the State laws in regard to the sale of liquor; to see that they do not sell whiskey by the drink as pharmacists.

Mr. NOEL—It is getting late, and I move that this subject be tabled until to-morrow, and taken up under the head of unfinished business.

Carried.

THE PRESIDENT—I notice present here a gentleman whom I would like to introduce to the Association, Mr. Frank Hamilton, the President of the Business Men's Association. I have the pleasure of introducing Mr. Hamilton.

Mr. Hamilton made a brief speech, expressing his interest in the work of the Association.

The Association then adjourned.

FOURTH SESSION.

THURSDAY MORNING, JULY 13TH.

The meeting was called to order at 9 o'clock.

F. J. Wurzburg in the Chair.

PROF. PRESCOTT—I have here a paper written in answer to Query 19: "What practical uses can the druggist make of a microscope, and what is the cost of such an instrument as would serve his purpose?" which was accepted by Mrs. L. R.

Stowell of the University, who has been prevented by other engagements from attending here, and which I will read.

(For this paper, and others presented afterwards, see subsequent pages.)

Dr. LYONS—I think a paper of this character merits special notice in the form of a resolution of thanks to the author. In the case of members who are present it is not always the proper thing to do to distinguish between papers, but I think no one will take exception to the recognition of the merit and value of this particular paper, and I will move that the thanks of the Association be given Mrs. Stowell for this very practical and excellent paper.

Carried.

Prof. PRESCOTT—We have a paper by Dr. Lyons in answer to Query 13, which reads: "An examination of the formulas of the several dispensatories, given as equivalents for those of the U. S. Pharmacopœia, is desired."

Dr. Lyons presented a synopsis of the paper, which is printed in full in subsequent pages.

Prof. PRESCOTT—We have had a query in our list for two years, and I am not sure but more. No. 45: "Is an apprentice in a drug store entitled to receive instruction in practical pharmacy from his employer, and to what extent is the latter held to grant a reasonable time for daily study?" This query, I am glad to say, has been accepted by a practical pharmacist of long expeience, and one who has been up to this time President of the State Board of Pharmacy, Mr. O. Eberbach.

Mr. EBERBACH—Upon an investigation of the subject I came to the conclusion that I could not answer the question in the sense in which it was given, but I have given a short history of the condition of drug apprentices, together with some suggestions which I present herewith to the Association for its consideration.

Prof. PRESCOTT—I move that the Association direct a reprint of this paper to be circulated in pamphlet form to the registered pharmacists of Michigan. The Association has taken

ground as an educational body, and it seems to me this paper would be an important measure of education. It is offered by one who has had his own and his father's experience in practical business for more than a generation, and by one whose views of the subject have been matured, no doubt, by observation on the Examining Board of this State. With the support of the members of this Association who have already spoken upon this paper, I make this motion. (For discussion referred to see subsequent pages.)

Dr. LYONS—I would like to second that motion. It seems to me that in this particular direction not only the Association of our own State, but those of other States, have an important mission, that, I mean, of the education of the drug clerk. I am very certain that a large number of intelligent druggists are perfectly competent to instruct their clerks, but have simply given the subject no thought, and have ignored its importance. If a paper of this sort is brought to their attention, I have no doubt it will have an effect to quicken their moral perceptions at once. There should be some care in the selection of assistants, and an examination of some sort, either formal or otherwise, of those we employ. The great difficulty, not only among druggists, but among physicians, especially among the physicians, has been that boys have entered the drug store or the doctor's office because they fancied they would like to be druggists or doctors, when the fact is they may have had no preliminary education whatever, although possessing some natural qualifications. If they could have it impressed upon them that a year or two years in the common school was a necessary qualification before they entered the drug store or the doctor's office, it would be a great help in sifting out the persons unfit to become pharmacists and physicians, and this is especially necessary if we are to have, as we know we shall have, a higher standard of education in the next five years. I hope this paper will be distributed in the way suggested.

Mr. JESSON—I would like to amend the motion by moving that a copy be sent to each drug firm in the State of Michigan, and I will state my reasons. A great many of the pharmacists

of the State have three or four men in their store, and it is not necessary to send a copy to each one of those four.

Prof. PRESCOTT—I accept the amendment and also the amendment to leave out such drug houses as are represented by membership in this Association.

The motion as amended was then carried.

Prof. PRESCOTT—Prof. Stevens will now read a paper in reply to Query No. 22: "Which are the more uniform in strength, preparations made by weight or measure?"

Dr. LYONS—Before this paper is read, I wish to say that I notice present a member of the Ohio State Pharmaceutical Association, Dr. Spenzer, of Cleveland. I am glad that he is with us, and I move, Mr. Chairman, that he be invited to participate in our discussions.

Carried.

Dr. SPENZER—I am very thankful to the Association for this honor. The Michigan Association is fortunate in the number of papers presented at its meetings; I notice that they have a surplus of papers left unread. In Ohio we very seldom have any left. We do not have much discussion on them, not as much as I have heard here to-day, which I think is a valuable thing. I consider it a great honor to be on the floor of this Association.

THE CHAIRMAN—The postponed discussion on the report of the committee on Trade Interests is now in order.

Mr. BASSETT—The question we were discussing was the measures we should adopt to relieve ourselves from the odium of being classed as saloon keepers. Since our last meeting this matter has been talked over a great deal by our members, and it is to be hoped that we shall reach some proper solution this morning.

Mr. EBERBACH—Since our last session, some of us have taken opportunity to talk over that matter in regard to protecting the Association against assaults of the character that have been referred to, and it seems to me that the proposition presented by the committee is the key note in

solving the problem. We have plenty of time before the next session of the Legislature to consider this question, and I think it would be a matter of policy for this Association to appoint a committee which shall be distributed over the State to investigate into these charges, and report to the Association next year with positive proofs of such traffic, which is humiliating to the profession at large. I think the committee such as I have suggested would be able to present the facts which would warrant the Association in proceeding to force the authorities to execute the laws of the State in regard to retailing liquors in drug stores. I think this method would lead to the least amount of disturbance in our ranks and in the mercantile houses of the State. It is a very delicate question and it will be difficult to draw a line which will prove satisfactory to the profession and to public sentiment.

Mr. GUNDRUM—There should be something done at this meeting, and I think the matter should not be left to a committee who shall make their report at the next meeting, for this reason: it will come up just before the Legislature meets again, and then the Legislature will probably say you have waited until this time and have done nothing until now. We talked it over two years ago, and came very near passing a law; you have waited until this time and now come here and beg the question. We were spoken of as a lot of lobbyists, at Lansing. We were there, of course; we went there to look after our own interests. We would have been ruined if the law had been passed which was spoken of. I, for one, am in favor of immediate and vigorous action; we should appoint a committee with power to do something at the present time to enforce the law.

Mr. EBERBACH—I would like to sustain my views upon the matter for the following reasons: we shall have two sessions before the next Legislature meets, and that will afford us ample time to show the members of the Legislature that we are acting in good faith. We are bringing up here charges, but there is no one here who is willing to stand upon the floor and bring these facts before the Association against any individual. We had a movement last year with reference to wholesale druggists retailing, and when the subject came up yesterday I failed to

hear a single individual bring any charges against any individual that could be sustained by proof. If we give our committee a chance, they will present the facts to the Association next year which will warrant the Association in proceeding. I think it would be unadvisable for this Association to proceed upon mere assertion.

Mr. GUNDRUM—I do not believe that it requires a committee to gather evidence. I do not think a person would have to go far to find druggists who abuse their rights in selling liquor.

Mr. NOEL—Would you not have to depend very largely for your evidence on the class of people surrounding the drug store? In the place where I lived up to last fall, it was commonly reported that there was a drug firm there that made more from selling liquor than from drugs. Neither one of these men are members of this Association, and I presume it will be found generally that such men are not members of this Association. We shall have to depend very largely upon the people to insist on the enforcement of the law, and we should be compelled to secure co-operation. It therefore seems to me wise and proper that we should make a strong expression here in regard to the practice of selling liquors illegally by druggists, as suggested by Mr. Bassett yesterday.

Mr. BUGBEE—It seems to me the discussion is wide of the suggestion of the committee. As I understood the suggestion it was that a committee should be appointed by this Association, having charge of the prosecution of persons complained of as retailing liquor by the glass. To place the matter in definite form, I move that this Association elect a committee of five to take this matter in charge for the prosecution of those complained of for retailing liquor by the glass. I think that the one furnishing the evidence or making the complaint should be relieved of the embarrassment of appearing.

THE PRESIDENT—Would it not be better to have the committee appointed by the incoming President?

Prof. STEVENS—I do not exactly like that idea, for the reason that Mr. Bassett is the incoming President, and he is the man we want at the head of that committee.

Mr. BASSETT—This is an exceedingly difficult question to handle; and it seems to me if we accomplish anything we must get hold of the right idea. If we elect or appoint a committee of druggists we meet the difficulty at once that no druggist in the State of Michigan wants to take it upon himself to enforce the liquor laws of the State, or to see that they are enforced, on account of the odium that will attach to him from such action. If we could carry out the idea of having a committee whose duty it shall be to gather evidence in such cases and lay it before the civil authorities, I think it would be better. It is not my idea that this Association shall prosecute anybody. All we have to do is to secure evidence that shall be indisputable against violators of the law, and present this to the proper authorities. If we can get some one on that committee who thinks it will not interfere with his business, I think we ought to do it, and I want to suggest right here that I think the men to put on such a committee are men like Prescott, Lyons and Stevens, who are not embarrassed as we are by business relations. I think that now is the time to apppoint such a committee. Give them the power to investigate, and put the money in their hands if necessary, to investigate, and then perhaps let them come to the State Board of Pharmacy and ask their assistance. If they find facts to sustain a case, let them go ahead and get the tax placed upon the guilty man, and if we secure the taxation placed upon one man in this State who is openly violating this law it will have a very salutary effect.

Dr. STEVENS—I am very much obliged to Mr. Bassett for the able manner in which he has supported my position, and ask this Association whether they do not think he is the man to be placed upon this committee. So far as his being in the business is concerned, I think it has nothing to do with it whatever. If we have a committee of three or five it does not throw the burden upon any one man; it throws it on the Association, and if anybody takes exception to it they must look to the Association.

Prof. PRESCOTT—This question concerns the practice of pharmacy in this State, and we ought to look at it, I think, solely in that light, and not as a question of legislation gener-

ally, or as a question of temperance generally, but as a professional question affecting the practice of pharmacy. Laws of the State require practice of pharmacy to be carried on by registered men, and the laws ought to put these violations under the supervision of the State Board of Pharmacy. This has been done in Kansas or Iowa, I forget which, and I hope it will be done here. It is just as much the duty of the State Board of Pharmacy to see to it that gross and disreputable violations of the law are punished as it is to see to it that men do not sell drugs with no license. In every State where there is a pharmacy law that is made a function of the Board of Pharmacy, and why should it not be in this instance? I should be very glad if this Board could do some voluntary work to enforce the laws concerning pharmacy and in respect to the violations of the liquor law. I would not have the Association pass any resolutions—they are too cheap. I would have the Association do some work, if but a little, and spend some money, if it were but little, to prosecute those who take the name of druggists solely to cover illegal dram selling. I would have the Association by its committee or by its detective, take up such gross violations as may be called to their notice. There is no doubt there are such violations, and there will be more. Let those cases be commenced upon, and if that work is carried on for a year it could then be determined whether it could be carried on longer. It seemed to me at first that the executive committee was the proper body to do this work, but I most fully agree with the idea of having Mr. Bassett do it. If a committee is appointed, I think it should be a small one, and it should be understood that it has power to employ a detective's services, if necessary, with the money of the Association. If there is any objection to using the regular money of the Association for that purpose, which I doubt, let them ask for voluntary contributions. The Association unquestionably has the right, however, to expend its money for the protection of pharmacy in Michigan as it has for any other purpose, which is admitted to be proper by a majority of the members.

Mr. Bassett—Dr. Prescott has the idea exactly. This Association has only to let it be understood that it means to see that

the State laws in regard to the sale of liquors are enforced, as regards the drug trade. Let us have a committee with the Association back of them as authority. Let them print the resolution of this Association expressing its determination to see that the laws are enforced, and send this, together with a copy of the State law in regard to the sale of liquor by druggists, to every druggist in Michigan, and let the committee have access to the general funds of the Association. I desire to insist that this Association shall be back of this work; that it is no individual, but the full force and power of this Association that is back of the work. We do not want any individual to do it; we do not want any clique to do it; we don't want any prohibitionist behind it or anything political behind it,—simply the authority and fixed determination of this Association, which represents the respectable druggists of our State. Then, when any gross violation of the law is reported to the committee, let them investigate the matter, and if they find sufficient evidence, let them consult with the State Board of Pharmacy, and let them take such steps as are necessary to bring the man where he belongs and make him pay the tax of the saloon keeper.

Mr. LAMOREAUX—We will find it very hard in some counties to carry out that resolution, yet I heartily endorse it. If I understand it, the correct method of procedure is, when sufficient proof is furnished that a druggist is selling liquor, it shall be presented to the prosecutor of the county. Now suppose the prosecutor of our county is on good terms with the person complained against. He simply says to the person bringing the complaint, I will see to it in a few days, and time passes on and he pays no attention to it, then what can be done? I am in hearty sympathy with this movement, and I think much can be accomplished if our committee take hold of it earnestly. In our county I know from actual knowledge it would be hard work to make the prosecutor move against saloon keepers, yet he is an honest man, I suppose, but he has not the moral stamina, and you will find that to be the case in many counties.

Prof. PRESCOTT—It would be worth something to have a record in hand that this Association had done all it could to have these cases prosecuted.

A MEMBER—We have druggists in this State, perhaps members of this Association, who are openly violating the law of the State, but how are you to get evidence against them? If there is anything we can do, I would like to see some action taken to crush out the saloon drug store. Unless we take the matter in hand in dead earnest, we shall never do it.

Mr. WELLS—I do not suppose that any member of this Association will accuse me of favoring the liquor interest in any way, for in everything I have said, and in several addresses I have had occasion to make before the members of this Association at different times, in season and, perhaps sometimes, out of season, I have advocated that in some proper way this evil should be driven from our midst. As has been said by several gentlemen, it is a serious question to grapple. I do not think, as I said before, that any member of the Association will accuse me of favoring the liquor interests, when I say I oppose the appointment of this committee. I oppose it because I do not think it is practicable, at the same time I think something should be done by the Association at this time, and therefore, I present, as an amendment to the motion, the following resolutions, and ask their adoption.

WHEREAS, Certain pharmacists of Michigan, composing as we believe a small proportion of the entire number, are known to sell liquors contrary to law, to morality and to the spirit which should animate a class whose business is to heal rather than destroy, thereby bringing into disrepute all who are members of this profession; and

WHEREAS, The Legislature, at its last session, passed an act taxing heavily all engaged in selling liquors as a beverage, but exempting druggists selling liquors for other and proper purposes from such tax under certain conditions; therefore be it

Resolved, By the Michigan Pharmaceutical Association, that we imperatively demand of every druggist of the State, whether he be a member of this Association or not, that he comply strictly with the letter and spirit of this law; that his failure to do so will lead him to be regarded by us as outside the line which divides an honorable profession from an ignoble and vicious calling.

Resolved, That this Association will not receive into membership any person known to be engaged in selling liquors as a beverage, and that such practice will be regarded as good grounds for expulsion under Article 10 of our By-laws.

Resolved, That should the evil complained of by us not cease we will endeavor at the next session of the Legislature to have the Pharmacy Law so amended that the Board of Pharmacy shall be debarred from registering as a Pharmacist any person whom they shall have been convinced does not comply with the law.

Resolved, That the Secretary of this Association be instructed to have printed these resolutions and the portion of the liquor law which applies to druggists, and mail a copy to each drug firm in the State.

Dr. LYONS—I second that motion. This question is a very difficult one for us to handle. The proposition to engage as an Association in police work does not commend itself to me, at least at the present time, as practicable. It is easy for us, however, to take the steps which Mr. Bassett has pointed out, and these are, for the most part, included in Mr. Wells' resolutions, which do not stop with expressing our strongest disapprobation of these violations of the law, but which provide also for warning and threatening the guilty. This seems to me enough for the first step; we do not pledge ourselves to prosecute offenders, outside of our own body, but we do express our intention to expel from our ranks all members guilty of violating the law, and we intimate that we shall, hereafter, take active measures to exclude from our profession all who make it a cloak for dram selling. It seems to me that if we should pledge ourselves to see that the law is enforced and should not do it, it would be said of us that with all our show of zeal, we were really in collusion with the saloon druggists, and that, like police officers and prosecuting attorneys, we have our price. What I specially fear is that no committee can be found which can possibly devote the time and energy to the work demanded of it to make it at all effective, and little could be done without large expenditure of money as well as of time; it would be hard to find men willing or able to serve the Association in such a capacity.

Mr. WELLS—I wish to say further in support of these resolutions, that I believe, with the experience we had at Lansing last winter, they are of the greatest importance. I was told, and I presume other members were told by legislators that the druggists themselves were indifferent to this thing, and I was

asked to point out anything we ever did to prevent it. Of course we could retort and ask them what they had ever done to prevent the sale of liquor, but they would say that they passed the laws but they were not bound to execute them, while the druggists had taken no steps at all, looking to proper legislation. I sincerely hope the resolutions will pass, because from the experience I have had I feel confident it is the very best the Association can do.

Mr. BASSETT—I certainly hope that these resolutions, or something of a similar nature, will be passed by this body, but that we will not stop with passing resolutions. It is easy to make and adopt resolutions, but resolutions alone will accomplish nothing. We may threaten to expel members who violate the law, but as has been said here already, the men who do this sort of thing do not belong to this Association, and they are not likely to seek affiliation with us, they don't want anything to do with us. The resolutions are all right, but let us go further. Let us warn the saloon druggists that there is trouble ahead for them. Let us point out to them the penalties of the law, and then take steps to see that the law is enforced. If we do not convict a single man, if we take steps to do it, then we can go to Lansing and say we have spent our time and money in endeavoring to convict them. Then our legislators can believe that we are in earnest when we say that we do not approve of selling liquor without a license. Then we can ask for an amendment to the law, not permitting a man to be registered as a pharmacist who violates the statute.

Mr. WELLS—It seems to me these resolutions do that very thing. They are not buncombe resolutions, and are not intended as such. They are intended to apply a remedy for this evil. They are intended to do it by showing those who are guilty of this offense that we intend they shall be punished for it, and they point out the manner in which the punishment shall be inflicted. The appointment of such a committee as is talked of is all right in theory, probably, but practically I am satisfied it will amount to nothing. It will amount to nothing because you cannot find a druggist on this floor to-day who is willing to take the responsibility or bear the odium of bringing

charges against his neighbor. In spirit it is all right, and I sincerely wish a committee could be appointed which would have the power and would exercise it in such a manner that it would drive this miserable blot upon the pharmacists of the State out of existence.

A MEMBER—I would like to ask Mr. Wells the manner in which we could point out the guilty one if he had no committee to find out about it. How could we find them all?

MR. WELLS—The whole Association should constitute that committee, and whenever any individual finds that in his neighborhood a member of our Association is guilty of this practice he should be prompt to report it to the State Board of Pharmacy..

Prof. PRESCOTT—I have a great appreciation of the labors of Mr. Frank Wells, and of the committee who went to Lansing last year, and I feel very deeply in speaking upon this question as I have already done. I am giving the words of one who has done no deeds and I know that the actual working men upon this question are represented to a great extent by these resolutions. I have said that I believed it to be properly the duty of the Board of Pharmacy to thrust out from the practice of pharmacy, those who are saloonists under the guise of druggists, and the one feature of these resolutions which commends itself very strongly to me is the last recommendation. It seems to me that it is not practicable, in view of the difficulties of the case, for us to make an announcement and then defer operations until the next session of the Legislature. I do not know that I should vote against the resolutions at all, and I do not know that I would vote for the resolutions, but I do not exactly see why these resolutions should be substituted for a committee to do something, the action proposed. I cannot myself see how this Association could be blamed for not enforcing the law against druggists all over the State of Michigan; I cannot see why we should be classed as police officers when we undertake to do something. I do not think any one who has any semblance of reason could urge that against us, and it does still seem to me that the Association might expend some efforts and

some money in bringing proof of the grossest violations of law to the civil authorities. It has been said already over and over again, that the object is to prevent the necessity of one firm in a town making complaint of another, and that we propose to have a representative of the entire Association and a professional detective under the employ of the committee to do this work. However, we ought not to be impatient. If it be better to wait and see what this resolution brings forth I shall not feel that the Association has done very badly. Yet it seems to me it is a greater delay than we need to make.

Prof. STEVENS—While I favor the resolutions it seems to me the point made by Mr. Wells is not the strongest objection that could be made. While he objects to the appointment of a committee, and says there is no one who wants to take the responsibility of bringing himself into disrepute, at the same time he says this whole Association should enter into the work and should point out the man. So far as I am concerned I would as soon act in one capacity as the other, and I see no difference whatever. I think we should go on with the work suggested by Mr. Bassett, although I think the resolutions are all right.

Mr. TODD—I am highly delighted that the Michigan State Pharmaceutical Association have in view some special work regarding the purity of the profession, looking to the prohibition, as far as possible, of the selling of liquors illegally. I see no reason why a committee should not be appointed to watch over the purity of the Association and protect the people of the State of Michigan. As to the objection that it would result in odium being cast upon some members, I do not see how it could be possible if they are appointed as a committee, with that object in view. It is then their duty to the Association to see that the work is done. No odium or malice could attach to that committee by any one. It would be much more difficult for a private member of the Association to prefer charges against anyone violating the laws than it would for a committee appointed for that purpose. I should be extremely glad for myself to see a committee appointed.

Mr. WELLS—Mr. Chairman, I withdraw the resolutions as an amendment to the motion.

Mr. BASSETT - I sincerely hope that Mr. Wells' resolutions will be acted upon and adopted. They certainly give expression to the sentiments of this Association, only they do not provide for active measures to secure the prosecution of liquor-selling druggists.

Mr. FISHER—I have been listening to the discussion, and I have paid some attention to the pharmacy laws, and I think Mr. Bassett's plan is the right one. I think that we ought to have enacted a law, as soon as possible, that every man who opens a drug business shall be registered. In the Dominion we started a law the same as we started it here. We had the very same difficulty, and when I arrived here I found the same difficulty. In the northern portions of this State that is a very great grievance to us. When we look the matter all over and consider who these men are, we frequently find that they are not druggists in any shape or form. They are a disgrace to the drug trade. For instance, our small town will support one store and probably give one man a good living. We have a good druggist there. He is registered, and a graduated pharmacist of the college. He was doing a very nice little business. Another man right behind him had a little capital and he said, "I can do a little business," and he put it into stock in charge of a drug clerk. His clerk received a certificate under the State law, and he got his certificate without passing any examination at all, therefore he is not a qualified man. We can get lots of such men throughout the State. I can show you in Port Huron lots of young men walking around there whom you can hire for from seventy-five cents to a dollar a day. In the Dominion we appointed a committee and employed a detective, and after we showed to the authorities that we were sincere in what we were doing, that we felt a grievance over the matter, the Legislature took hold of it and gave us a law that required that a man should be at the helm himself. Now we will say that we appoint this committee and employ a private detective. We will say that I am hiring a druggist or a clerk, and I say to the clerk, "You attend to the front part of the store and do

the dispensing, and I will attend to the liquor business." A detective comes in, but what can he do? I have no certificate to forfeit; I am only a saloon keeper. We had a case about eight miles away from our town of a man who couldn't get a license, and he put in a drug store for a while. I was appointed a committee to go down and see the Township Board about the matter, and when the matter was laid before them they took cognizance of it and didn't accept his bond. How long did his drug business continue? Not long, I can tell you. I would like to see the enactment of a law that would say to every man that opens up a drug business, you must be at the helm yourself.

Mr. BASSETT—I would like to offer as a substitute to the original motion, that the Executive Committee of this Association shall have authority to investigate any case where complaint is made to them, and lay the matter before the civil authorities for action.

The substitute was carried.

Mr. BASSETT—I now move the adoption of Mr. Wells' resolution.

Carried.

THE CHAIRMAN—Is there anything further from the Committee on Trade Interests?

Mr. BASSETT—The next question on our list is that as to shorter hours for druggists and for drug clerks.

Mr. JESSON—If we can do away with drug store drinking we can close earlier. We have to keep open as long as our neighbors do, and they must keep very late hours for some of their customers.

Mr. VERNOR—I think the question of shorter hours is a very simple one. It remains with the clerks themselves. If they ask for shorter hours they will get them—or lose their positions. Any store that can afford to give shorter hours will find it to their interest to do so. I have tried it and I know it. No man in my employ works over nine and a half to ten hours a day, and I keep open until eleven o'clock.

Mr. WEBBER—We had been in the habit of keeping open until ten or twelve o'clock, but in our town a petition was circulated to have the stores closed at nine o'clock, and we agreed to close at that hour, and I think the agreement has been kept. It has been just as satisfactory to all the men in the business to close at that hour as it was to remain open until twelve o'clock at night.

Mr. GUNDRUM—I didn't circulate a paper at all, but I shut up my store at nine o'clock at night.

Prof. STEVENS—I think Mr. Gundrum puts it just right. That is the only way you can do it. You can do it by agreement in small places, perhaps, like Grand Rapids, but you can't do it in Detroit. We have tried hard to get druggists to consent to certain hours for closing and to arrange for shorter hours on Sunday, and we have been unable to do it. The only way is for each man to shut up when he is ready.

THE CHAIRMAN—We have tried it in Grand Rapids, but men will stand out to keep open as long as they can.

Mr. BASSETT—The next question on the list is the cutting of prices.

Mr. WEBBER—I think the difficulty could be overcome by the organization of local associations. We have one, and I think with one exception our price schedule has been lived up to.

Mr. BASSETT—We want to hear from the Grand Rapids Association.

THE CHAIRMAN—Our Association has been organized about two years and a half, and the price list has not been violated except in a single instance. We have had one complaint; it was thoroughly investigated and found that there was no foundation for it whatever. I think myself a local organization is the only way to prevent the cutting of prices. Without seeming to advertise the Grand Rapids price list at all, I think if these local societies organized, or about to be organized, will adopt that price list, they would very soon find that their mar-

gins on that class of goods would be increased from fifteen to twenty-five per cent., and the articles included in that price list cover a very large proportion of the druggist's business.

Mr. WELLS—I would like to inquire if that price list is published and can be secured.

THE CHAIRMAN—They are for sale and can be had by application to the Chairman of the Grand Rapids Society at fifty cents per copy.

Mr. BASSETT—The only other subject we have for discussion is the matter of mutual fire insurance, which was laid over from yesterday.

THE CHAIRMAN—Mr. Fairchild has informed me that he will not be able to be present at this session; that he has telegraphed to Grand Rapids for the papers, but they have not arrived.

Mr. PARKILL—I wish to give notice that at the afternoon session I shall introduce an amendment to our By-laws. I have here some applications for membership which have been acted upon by the Executive Committee.

H. W. Potter, Jenisonville.
A. L. Thompson, Harbor Sp'gs.
J. E. Bower, Crystal Falls.
E. Wilson, Stanwood.
George E. Starr, Plainwell.
A. Patenaude, Norway.
D. O. Roberts, Kalamazoo.
Pascal P. Nelson, Northport.
W. H. Beck, Detroit.
C. E. Kellogg, Grand Rapids.
A. C. Merrill, Cross Village.
J. W. Cosford, Mancelona.
A. C. Schumacher, Ann Arbor.
Hiram Arthur, Dowagiac.
Will H. Wood, Sheridan.
C. H. Wilbur, St. Ignace.
M. A. Grandy, Sault Ste. Marie.

On motion the Secretary was authorized to cast the ballot of the Association for these candidates, who were declared duly elected.

Mr. WELLS—I believe that at every annual meeting of this Association thus far, I have had a very pleasing duty to perform, and if the Association will permit me I would like to introduce the following resolutions at this time:

Resolved, That when we turn homeward from the shores of this beautiful bay, we shall carry with us reminiscences of most delightful hours. As we breathe the pure air which surrounds us as a continual benediction and our souls are filled with the loveliness which every changing view presents, language fails us, and we can only murmur Michigan, my Michigan.

Resolved, That, rich and varied as are the charms which nature has bestowed upon this favored spot, she has reserved some of her best gifts for those whose homes are here, and whose hospitality and good will has added so greatly to the pleasure of our visit. Our earnest thanks are due and are hereby tendered to them. To our local Secretary, Mr. Harwood, and to the druggists of Petoskey, we are under obligations for their zeal and efforts to render our stay delightful and our meetings pleasant and profitable. To ex-president Crouter our thanks are especially due for providing the delightful excursion to Charlevoix, and for hospitable and kindly entertainment while there. We trust that, however feebly we express our thanks for these many courtesies and kindly acts in words, the gentlemen to whom they are tendered will believe that they will not soon be forgotten.

To the ladies who have graced our meetings with their presence, we also desire to express our thanks, and to indulge the hope that we may continue in still greater measure to be thus blessed.

Mr. Bugbee—I move that the funds of this Association be placed at the disposal of the Executive Committee for the practical enforcement of the work put upon it by Mr. Bassett's resolution.

The Chairman—Such a resolution is unnecessary. The Executive Committee have charge of the funds in any case.

On motion, the Association adjourned until 2 P. M.

FIFTH SESSION.

Thursday Afternoon, July 14th.

The Association convened at 2 P. M. Chairman Wurzburg in the chair.

The following papers were read by title by Prof. Prescott.

Query No. 4: "A quantitive determination of the mineral constituents of the waters of Lake Superior is desired." Accepted by W. F. Jackman.

Prof. PRESCOTT—Mr. Jackman's report is, so far as I know, the first full mineral analysis of Lake Superior water and the water was obtained off Keweenaw Point.

Query No. 5: "What advantages has lanolin or agnin over the ointment bases now in use." Accepted by S. B. Carr.

Query No. 6: "A simple method of estimating the quantity of glycerin in fluid extracts, etc., is desired." Accepted by A. J. Baumhardt.

Query No. 7: "Is copper present to an injurious extent in medicinal extracts, solid or fluid?" Accepted by D. T. Shuler.

Query No. 9: "What proportion of quinine does commercial citrate of iron and quinine contain?" Accepted by E. C. Federer.

Query No. 17: "What is the quality of the cinchona bark found in retail drug stores?" Accepted by L. A. Ellis.

Query No. —: "In Kerner's volumetric estimation of other alkaloids in quinine sulphate, what effect has temperature during titration?" Accepted by E. A. Ruddiman.

Query No. 29: "What strengths of the tincture of opium are furnished in pharmacy in this State?" Accepted by A. Van Swaluwenburg.

Query No. 30: "What are the causes of variations of color in the tincture of opium?" Accepted by J. O. Slotterbeck.

Query No. 33: By what influences is cocaine liable to be converted into amorphous alkaloid? Is hygrine a definite compound?" Accepted by F. G. Novy.

Query No 35: "What is the best place for the prescription stand?" Accepted by A. B. Stevens.

Query No. 36: "By what method can medicinal phosphoric acid be estimated volumetrically?" Accepted by B. W. Cheever.

Also, a volunteer paper by Dr. Lyons, criticising the conclusions reached by Messrs. Wrampelmeier and Meinert in the paper offered by them at the last meeting of the Association, on the U. S. P. method of assaying opium.

Mr. PARKILL—I wish to offer an amendment to Section 9 of the by-laws, so that it will read as follows: "The proceedings of the Association, with the roll of its officers, committees and members, shall be published annually under the supervision of an editor, who shall be elected annually, and who shall be paid from the funds of the Association, and a copy be sent to each member of the Association."

THE CHAIRMAN—Would it not be better to say a copy shall be sent to each member of the Association who is less than two years in arrears for dues?

Mr. PARKILL—I accept that amendment. My object in presenting the amendment is this. The labor in connection with the publication of our proceedings is somewhat extended, and it takes a great deal of time—from one to two months—and it comes, too, when other work incidental to the secretaryship is pressing upon the secretary, and anyone who has work to attend to in connection with this other work has hardly time to attend to his regular business, and so far as I am concerned I have not the time to give to the publication of the proceedings. I did it one year, and it took considerable time, and some fault was found because of the delay. If we had a secretary who was not engaged in other business I suppose he would have time to attend to it.

The amendment was adopted.

Mr. PARKILL—I move to amend Article 1 of the By-Laws, which provides that twenty members of the Association shall constitute a quorum. We sometimes experience difficulty in getting together twenty members, and if we desire to call a special meeting we will be more likely to get a quorum under this amendment. I offer the amendment that "Twelve members shall constitute a quorum for the transaction of business."

Carried.

The Executive Committee reported that they had investigated the accounts of the secretary and treasurer and found them to be correct.

A motion prevailed to adopt them.

THE SECRETARY—I have a communication from Hon. M. H. Ford, expressing regret at not being able to attend the meeting of this Association, and wishing it a successful session. I also have received a communication from Samuel P. Duffield, health officer of the city of Detroit, to whom I had extended an invitation to meet with us, expressing regret that owing to business engagements he could not be present.

Prof. PRESCOTT—I will say that an invitation was extended to Prof. J. U. Lloyd, of Cincinnati, to attend this meeting, and he gave a partial acceptance, but it was impossible for him to come, and he sends congratulations to the Association.

Mr. GUNDRUM—There was a new liquor law passed this year, and I offer a motion that so much as related to the druggists be published in the proceedings of this Association for this year.

Carried.

The question was raised of the advisability of holding our next meeting in September, which elicited some discussion, but it was not deemed expedient to change the date.

THE CHAIRMAN—The regular order of business for the afternoon is the opening of the question box.

Prof. PRESCOTT—The first question that appears here is one that had better be placed in the list of queries for next year. The next question reads: "What can we do to discourage physicians furnishing their own medicines, putting up their own prescriptions and retailing them to their patients?"

Mr. BUGBEE—One physician told me we could discourage them by selling them patent medicines.

THE SECRETARY—A physician who has plenty of time and who is looking after every nickel there is in the business, will very often put up his own prescriptions.

Prof. STEVENS—I think not so much for the money there is in selling medicine as for the patronage it brings in giving medicine and consultation at the same price. They do not charge anything for the medicine. If they did it wouldn't last long.

Mr. BROWN—In some cases I think physicians charge for medicines as much as when the patient buys it at the store. A great deal depends upon the character of the community. In some cases they have always been accustomed to having the medicines furnished by the physicians, and if a new physician comes in and tries to have the prescriptions put up by the druggist, he is not likely to succeed. Some physicians get around that point, and the druggist might suggest it to the physicians with whom he is upon intimate terms, by providing the patient some inexpensive thing to satisfy that idea, and then give him a prescription in addition. That is the custom followed by some physicians, and gradually he educates the people up to the idea that they must go to the druggist. For instance, one physician whom I knew gave nine out of ten who came to his office, a drachm or two of the tincture of iron, and the rest water and then gave them a prescription.

PROF. STEVENS—They are quite apt to give them this cheap medicine, then get it renewed by the physician, and then if it is taken by them to the drug store they say he charges an abominable price.

A MEMBER—We find it difficult for that reason in our section to have medicines put up by the druggists. We got the physicians all to agree at one time to send their prescriptions to the druggists, and it continued a week. We find it very often to be the case where the physician finds a hard case, one out of which he cannot get any money himself, that we get the prescription, and if you see two or three little crosses on the corner of the prescription, you may know he means get a little for me if you can, as well as for yourself, but we always make up our mind to get our own pay first, whether we suit the physician or not. But it is a difficult matter to get physicians in small towns of five or six hundred to write their prescriptions. They claim that if they would all do it, it would be satisfactory, but they put in the plea that when they are out in the country they have to supply it anyway.

Mr. BASSETT—It seems to me the only true solution of the question will be when we get the law that no man shall dis-

pense medicine, only the registered pharmacists. Of course we cannot do that yet, but as the towns grow larger and the lines are drawn closer, I think it will be possible to have it so that all medicines shall be dispensed by regularly registered pharmacists.

Prof. STEVENS—There is one thing that should not be overlooked, and that is the election of the editor of the proceedings, which was provided for this morning. The work was nicely done last year by Dr. Lyons, and I will now move that he be elected to fill that place.

The motion prevailed.

THE CHAIRMAN—The Committee on Exhibits will now report.

The Committee on Exhibits, through Mr. Bugbee, then reported as follows:

REPORT OF COMMITTE ON EXHIBITS.

To the President and Members of the Michigan State Pharmaceutical Association.

Your Committee on Exhibits visited the same at the rink last evening and beg leave to report as follows:

The Malto Manufacturing Company, Cleveland, by C. A. Boalt, exhibit Malto, a new nerve food, and Malto Syrup for the soda fountain.

Foote & Jenks, of Jackson, by Mr. Foote, show an unusually fine line of Perfumes, their specialties being Linden Bloom and Linden Bloom Complexion Powder.

Eastman Bros. exhibit a fine line of Perfumeries and Soaps, very tastefully displayed.

Farrand, Williams & Co., Detroit, by E. C. Federer, exhibit a fine line of Fluid Extracts, Crude Drugs and Pharmaceutical Preparations.

McKesson & Robbins, New York, by C. G. Stone, a fine line of Gelatine Pills, Fruit Juices and Cocaine Salts.

Seabury & Johnson, New York, represented by C. N. Raymond, present a line of Plasters, Antiseptics and Absorbents that for perfectness and completeness are unexcelled.

The firm of Parke, Davis & Co. is represented by W. K. Walker, who needs no introduction to the druggists of Michigan. Their line of Fluid and Solid Extracts, Resinoids, Specialties, etc., is so complete as to need no commendation from us.

H. D. Cushman, of Three Rivers, by W. H. Shepherd, exhibits that best of "Pocket Companions," Cushman's Menthol Inhaler.

U. S. Torsion Balance and Scale Co., New York City, manufacturers of druggists' and jewelers' fine Scales and Balances are represented by Mr. A. L. Gallaher, and exhibit a druggists' counter scale which is sensitive to a half grain; capacity 20 lbs. Also, a Prescription Scale, sensitive to a 1-64 gr.; capacity 18 ozs. These scales have no knife edge and no friction.

Baughart Bros., and Roper & Baxter, Chicago, lines of Cigars.

Dallemand & Co., Chicago and San Francisco; a line of California Wines and Brandies.

Chapman, Green & Co., Chicago, by C. E. Chapman and A. W. Smith, show an elegant line of Fluid Extracts, Elixirs, etc., and we would specially mention their Sulphates Hydrastine and Berberine.

Milburn & Williamson, Detroit, by Messrs. Williamson & Ingliram, a line of Non-secrets. Also, an unusually large and fine line of Surgical Instruments and appliances, in charge of H. Hartz.

Frederick Stearns & Co., Detroit, by D. R. Parsons, a line of Non-secrets and Perfumes.

Charles Wright & Co., Detroit, by Messrs. Wright & Higgins, also a line of Non-secrets and Perfumes.

We found no one in at the Wayne Cigar Co.'s office, but opened a box of their A. O. G., and pronounce them good.

Dean, Foster & Dawley, by O. H. Robinson, present a fine line of Glassware and sundries.

The Evangelists, Hunt & Ingersoll, do justice to the Acme White Lead and color works by their display of Colors, Dry Paints, etc.

Last, though by no means least, is the display of A. N. Todd, of Nottawa, of the Crystal White Oils, Pip Menthol and other preparations. He has also procured a salt from the Oil of Erigeron to which, Prof. Flückiger, of Germany, gives the name of Limonen tetrabromide.

In closing this report, your committee beg leave to suggest that cigars and wines and liquors be excluded from among the exhibits hereafter. (Signed.)

C. A. BUGBEE,
H. B. FAIRCHILD,
A. H. LYMAN,
FRANK INGLIS.
HENRY KEPHART,
Committee on Exhibits

Prof. STEVENS—As to the point spoken of by the committee with reference to excluding cigars and wine, let me say that while I am probably as strong against liquor and cigars as any one, I do not think we have any control of this matter. We have nothing to do with the exhibit at present. The exhibitors

pay for their own space and they run the thing entirely, and we have nothing to do with it. If it were otherwise, I should be in favor of keeping them out.

Mr. PARKILL—We shall have in Detroit next year a local secretary of good sense, and I think we had better leave it to his good judgment.

Mr. BUGBEE—The suggestion was made to us on this point by several parties present at the exhibit last evening.

Mr. EBERBACH—In regard to the suggestion of excluding from the exhibit liquors, there is something of an inconsistency in such action, especially as long as the pharmacopœia recognizes wines. The wines that have been exhibited have been put on the market for medicinal use, and I do not think any objection could be made to such an exhibit, provided the liquor is not sampled in the exhibit room.

Mr. BROWN—I move as an amendment that the allusion to wine, liquor and cigars in the report of the committee be stricken out, and the committee's report then adopted.

Mr. PARKILL—I accept the amendment.

Carried.

Mr. INGLIS—I would like to offer a motion that at the next annual meeting this Association provide space for the exhibit, and that we hereby instruct the Secretary to so arrange the exhibits that those wholly of a strictly scientific and pharmaceutical character be separated from the others.

Mr. BROWN—Is it the idea that the Association shall rent the room and control it?

Mr. VERNOR—That is the idea.

Mr. BROWN—I support the motion.

Mr. BASSETT—The Association will then have the right to charge these parties rental.

Mr. VERNOR—No, sir; they have never paid rent, and it is a mere question of whether the local Secretary collects enough to pay for the room or not.

Mr. BROWN—I find that firms like Parke, Davis & Co. are willing to pay for space for exhibits. I think their view would be that the expenses incidental to the exhibit, the rent of the hall, light, heat, watchman, etc., should be presented in a bill and assessed *pro rata*.

Mr. VERNOR—We never have done this, and I think never will do so. The Secretary solicits exhibits, and it would be hardly proper for us to exact rent for them. I hope next year we will rather elevate the tone of the exhibition if possible.

Mr. GUNDRUM—If I am not mistaken, we voted two years ago that the Association should not have anything to do with the exhibits. I think the Michigan Pharmaceutical Association should not be responsible for any halls, and I think that was the action of the Association two years ago, at Detroit.

THE CHAIRMAN—There was such a resolution adopted two years ago.

Mr. VERNOR—This takes it off the shoulders of the Association and puts it in the hands of the local secretary.

Prof. STEVENS—I do not see any harm in charging the exhibitors for the expense of making the exhibit. It is a matter only of advertisement to them, and if the charge is sufficient merely to cover the actual expense, I can see no harm. At the Michigan Medical Association they expect to get enough out of the exhibitors to cover the rent of the hall in which they hold their meetings. I think that is outrageous, but at the same time I think the exhibitors should pay for the space they occupy, and I do not think there is a single house that will object.

Mr. VERNOR—The most of the exhibitors think it does not pay them. Parke, Davis & Co.'s man assured me to-day that so far as he was concerned he should be strongly in favor of not making the exhibit hereafter.

Mr. GUNDRUM—My opinion is that if necessary we might take up less room. I think last year, perhaps, or this year, there might be an exception to that, but some of these persons

who come here to exhibit cigars would not make an exhibit if they had to pay for space, and next year somebody might come and fill up the room with something people cared to see.

Mr. JESSON—I am credibly informed that the exhibitors are paying the hall rent here, and I have also been informed by one of the party showing a pharmaceutical exhibit that they had a great deal of trouble in collecting from the cigar men; they also told me that they would not exhibit again if that class of goods came into the hall.

Mr. BASSETT—The plan that Mr. Inglis proposes will exactly cover that point. If the Association assumes control of the exhibition, our local secretary will have the right to exclude whoever he sees fit. It strikes me that it is a splendid thing for this Association to try to have the very best class of exhibitors we can. I think a good exhibition tends to advertise us very largely, and I believe the expense we are put to for the rent of this hall, the arrangement of the exhibition, etc., will come back to us with interest, for very many new members will come for the purpose of posting themselves on the exhibit made, especially so if we have a good exhibition.

The motion was then carried.

Mr. VERNOR—I move that the Michigan Pharmaceutical Association offer a gold medal of the value of $25 for the most instructive exhibit displayed at its annual meeting to be held in Detroit in October, 1888, and that the Executive Committee shall act as judges of the exhibit.

Carried.

Mr. BASSETT—I think the insurance question was laid over again this morning; if the Association desires to take it up, now would be a good time. We have laid it over from time to time in order to obtain information. Mr. Fairchild telegraphed to Grand Rapids asking for papers, and received a reply this morning that the gentleman having them in charge had gone away, and the papers could not be obtained. I have in my hand a manual of the Wholesale Druggists' Insurance Association; I have looked it through somewhat carefully, and I find

their plan is to establish a fund of a hundred thousand dollars to start with, and then they propose to carry one-fifth of the amount of insurance carried by the wholesale trade. I do not find anything in it to assist the retail trade in forming its company.

Mr. BROWN—Did we not have a committee appointed last year to investigate this subject?

THE SECRETARY—I think not.

Mr. BROWN—I think it is worth while to appoint a committee to report next year on this matter of insurance. It seems to me a practical question that should be investigated, and I therefore move that a committee of five be appointed by the Chair to secure information and facts in regard to this matter of fire insurance among the retail drug trade, and report at the next meeting.

Carried.

THE CHAIRMAN—I will appoint as such committee, Mr. Brown, Mr. McDonald, Mr. Jesson, Mr. Fairchild, Mr. Inglis.

On motion, Prof. V. C. Vaughan and Mrs. Louisa Reed Stowell were elected honorary members of the Association.

Mr. BROWN—It is our custom to appropriate some specified sum to pay for the services of the secretary and the editor of the proceedings. I move that the same amount that was appropriated last year be appropriated for this work.

Mr. DUPONT—The secretary last year was allowed $200, and from that amount he paid the editor. I move that we appropriate for the secretary's salary $150, and for that of the editor $75, which is the amount I think he had last year.

Carried.

Mr. DUPONT—I now move that we pay the local secretary $50 for his services for the past year. I do not think that $50 will be any too much for the local secretary, or enough, as far as that is concerned, and I wish to add from this Association an expression of our sincere thanks to him. His work has been unusually taxing, since our meeting is held so far from the business centers.

Carried.

THE CHAIRMAN—Members of the Michigan State Pharmaceutical Association: I take great pleasure in introducing Mr. Bassett, the newly elected President. I bespeak for him the same hearty support which has been extended to his predecessors, and I am satisfied that in the hands of Mr. Bassett the new Association will prosper as well as the old has.

Mr. BASSETT—Ladies and gentlemen: Some men are born great, some men attain greatness, and some men have greatness thrust upon them. I think I can be justly classed in the last category, for I am very sure I have made no effort to obtain this high position. I sincerely thank you for the compliment you have paid me in placing me here, and shall endeavor to the best of my ability to fulfil the duties of the office. I trust all those interested in the work of this Association, all those appointed on committees having work to do, will take hold of it with hearty good will, so that we may go on growing from year to year and maintain the front rank in the sisterhood of State Associations. I suppose the only duty that devolves upon me is the appointment of committees at this time for the ensuing year. I will now announce as

Committee on Trade Interests:

F. J. Wurzburg, of Grand Rapids.
R. L. Latimer, of Jackson.
John Williamson, of Detroit.

Committee on Pharmacy and Queries:

A. B. Prescott, of Ann Arbor.
O. Eberbach, of Ann Arbor.
H. J. Brown, of Ann Arbor.

Committee on Legislation:

F. Wells, of Lansing.
D. B. Perry, of Bay City.
G. J. Parker, of Port Huron.

Committee on Adulterations:

A. B. Lyons, of Detroit.
D. E. Prall, of East Saginaw.
H. W. Snow, of Detroit.

I wish to say right here in regard to this committee that I thought best to take Dr. Lyons off the Committee on Pharmacy and Queries, and place him at the head of the Committee on Adulterations. I have associated with him Mr. Prall and Mr. Snow, both of whom are eminently qualified to make analyses of food, water, milk, or anything that may come before them. I have done this, trusting that we shall receive at our next meeting a report from this committee which will be a credit to us. It seems to me there is a large field of work for a committee of this kind, and it will be the means of making this Society very useful to the inhabitants of the State, and I trust we shall hear from them.

Committee on Unofficial Formulary:

A. B. Stevens, of Detroit.

Delegates to the State Pharmaceutical Association of Wisconsin:

W. J. Sawyer, of Menominee.
J. G. Johnson, of Traverse City.
Jacob Jesson, of Muskegon.

Delegates to the State Pharmaceutical Association of Illinois:

G. W. Crouter, of Charlevoix.
William L. White, of Grand Rapids.
F. W. R. Perry, of Detroit.

Delegates to the State Pharmaceutical Association of Indiana:

Henry Harwood, of Ishpeming.
C. E. Foote, of Jackson.
H. N. Dean, of Niles.

Delegates to the State Pharmaceutical Association of Ohio:

A. B. Lyons, of Detroit.
A. W. Allen, of Detroit.
Theodore Trowbridge, of Decatur.

Mr. Jesson—I move that a vote of thanks be extended to Mr. Wells, of Lansing, for the efficient work he did for the Association at Lansing.

Carried.

The Association then adjourned until the second Tuesday of October, 1888.

RETROSPECT.

Thus closes the official record of a meeting which although not very numerously attended was not behind any in the interest of its proceedings, and which gathered up as the fruits of only nine months of work papers more numerous than have been presented at any previous meeting, and fully up to the usual high standard in scientific value and literary excellence.

The Petoskey meeting will be remembered, however, by all who had the good fortune to be present less for its business sessions than for its incidents of social enjoyment and recreation. The members came to have a good time. They brought their families, glad of an excuse for treating them to a few days of the refreshing coolness of the upper lakes, and the unique beauties of landscape which attract visitors from all quarters. The wise ones came provided with fishing tackle, and planned to remain a few days after the sessions were over.

The delegation from Detroit, Ann Arbor, and other southern points had arranged to go in a body by steamer, and the party which left Detroit Saturday evening on the *City of Mackinac* numbered altogether about eighty. An incident of the trip was the presentation with appropriate ceremony of a gold headed ebony cane to Mr. Vernor, who, as member of the committee on transportation, had planned the trip, and made all necessary arrangements for tickets, staterooms, etc. Mr. Vernor had unfortunately neglected to make himself solid with the clerk of the weather, and the first day on the water was, as a consequence, not one of unalloyed enjoyment to the "susceptible" ones of the party.

About half the party elected to take the inland route from Cheboygan to Petoskey; they all say "wouldn't have missed it for the world," but exchange meaning glances with one another, which seem to imply that their enjoyment was of certain experiences of the trip retrospective only.

At the invitation of the druggists of Charlevoix, the members in attendance took a trip Wednesday afternoon to that delightful summer resort, where they were welcomed and entertained most hospitably by ex-president Crouter and other resident

druggists. The only shadow on the enjoyment of the occasion was caused by the knowledge that Dr. Crouter, while offering these free hospitalities, was carrying a load of anxiety on account of illness in his family.

Wednesday evening there was a banquet at the Arlington. After doing justice to an elaborate *menu*, the guests remained until the small hours enjoying the richer feast of wit and wisdom that had been provided in the program of toasts and responses. Frank Wells acted as toast master; the only regret that could have occasioned was that he could not be one of the speakers of the evening having unfortunately *forgotten his manuscript*, he was dumb.

The following toasts were proposed: "The State Association; the Accomplishments of the Old and the Promises of the New." Response by H. J. Brown, of Ann Arbor. "Michigan, its Pine Boards and its Seaboard," not to mention *shingles*. Response by Frank Hamilton, of Traverse City. "Pharmaceutical Literature, its Character and Growth." Response by Geo. McDonald, of Kalamazoo, an able and scholarly production, which the committee on queries have claimed for publication in the proceedings. "Our Angel Visitors, the Traveling Men." Response by A. Bassett, of Detroit. "Allied Interests, the Retailer, Jobber and Manufacturer." Response by Jacob Jesson, of Muskegon. "Affinities, Chemical and Other." Response, *of course*, by S. E. Parkill, of Owosso, crowning appropriately the evening's enjoyment.

Thursday evening there was a hop at the Arlington.

Many of the members remained after the adjournment to enjoy a few days' trout fishing, or extended their trip to include the historical island of Mackinac, and the picturesque St. Mary's river, with its famous ship canal and its "Sault." All who went to Petoskey look back to the trip as a delightful episode in the midst of a particularly trying spell of summer.

ANSWERS TO QUERIES

—AND—

VOLUNTEER PAPERS.

READ AT THE FIFTH ANNUAL MEETING IN PETOSKEY.

Query No. 19.

What Practical Uses can the Druggist make of the Microscope, and what is the Cost of such an Instrument as would Serve his Purpose.

By Louisa Reed Stowell, Ann Arbor, Mich.

Great proficiency has been attained in the construction of microscopes of late, and as a result, a new impetus is given to the study of the sciences. This activity reaches far beyond botany and zoology. There is not a branch of Pharmacy which may not call upon the microscope for aid. The practical uses of this instrument, however, are what interests us.

I.—USE IN PHARMACY.

1. The microscope is of use in examining crude drugs and powders.

Although it is said no two leaves are alike, and no two blades of grass are identical, yet the characteristics of all belonging to one family are so strong as to be easily recognized. A maple leaf, whether grown on a sturdy tree in the forest, or on the delicate silver maple of the garden, is easily identified as such. It is so with the internal structure of all drugs. Although differing slightly in detail, still the characteristic formation is so strong that one who is familiar with it may recognize any drug under the microscope. The minute structure of calamus can never be mistaken for that of zingiber or of taraxacum.

Great changes have taken place in the character of the stock of drug stores during the past decade. Formerly one saw long rows of bottles labeled *radix* this, or *folia* that. Now, powdered drugs or the alkaloids and active principles of the plant, have largely taken their places. The microscope is even more necessary in identifying these. In many cases the unaided eye cannot readily distinguish between two different kinds of alkaloids when the physical characteristic of the plant yielding these was very striking, as, for instance, quinine and morphine. It is possible to so treat a thin section of a drug containing an alkaloid as to see the alkaloid and to understand the exact position which it occupies with reference to the other cell contents of the plant.

You may ask how it is possible to distinguish structures when in a powdered condition. The answer is: In reducing a crude drug to a powder, the cells which compose the structure or drug, are not, as a rule, destroyed; they are simply separated from each other. Each one of these cells retains its own characteristic. This individuality may be due to its shape; or to the markings on the cell-wall; or to the thickenings of the walls; or possibly it may be due to the presence of peculiar starch grains or crystals in the cells. Our time is too limited for many illustrations. But let us compare cinnamon with cassia, the two spices so often sold for each other in our grocery stores. In the case of the cassia the fibres are longer, and have thicker walls than those of cinnamon; while the stone cells are larger, and, strange to say, contain starch grains, while those of cinnamon do not.

The difference between the varieties of powdered cinchona is largely due to the peculiar appearance of the *prosenchyma* or bast fibre. The difference between bean flour and oatmeal is almost entirely microscopic.

2. The microscope is of use in examining for adulterations. Much literature has appeared on this subject and considerable that has been written about the adulterations of foods, drugs, spices, etc., has treated it in so light a manner that many regard it as a simple subject to understand. There are some

simple cases which possibly give rise to this opinion, as, for instance, detecting the presence of starch where starch does not normally exist. The majority of cases are more difficult, however, some being quite complicated. With the greater number of powdered drugs the examiner must be perfectly well acquainted, not only with the entire structure of the drug itself but with the cell contents also. This may not be an easy task by any means. Possibly an illustration will help us to understand this better. Let us examine the simplest one of the spices, the mustard. Small as is the grain of mustard seed, there are six distinct structures, all differing so decidedly, they appear to belong to six different plants. One must become thoroughly acquainted with each of these six structures, both with their appearances on a face or surface view, and with them on a cross or vertical view. We have then twelve differently appearing structures with which to become acquainted before we can say that the powdered mustard is pure or adulterated. This is only one part of the work, and the easiest part. Being able to assert that a certain powder is pure or adulterated is one thing, while being able to identify the substance used with which to adulterate the powder is another question. It is easy enough to identify certain substances used as adulterants, which we see under the microscope, as, for instance, the starches, etc. But the ability to identify everything is beyond human power. In order to do this, one would have to be acquainted with the minute structure of every substance existing, whether belonging to the animal, vegetable or mineral kingdoms. And to be able to recognize these under any condition, whether normal or abnormal. You will not be surprised at this, when you consider the great range of substances which have been reported as found in what were advertised to be pure foods. Take wheat flour, for instance, and not unfrequently some other flour, as bean flour with alum and bone-dust, are found. In sugar, wheat flour, chalk, lead, and bone-dust have been reported. So each of the three kingdoms contribute to the list. There are comparatively few substances from either the animal or the mineral kingdoms used as adulterants.

3. The microscope is of use in examining for inorganic poisons, such as the alkalies, mineral acids, arsenic, mercury, lead and zinc, according to Dr. T. G. Wormley. These examinations, as a rule, follow chemical tests, though that is not always necessary. The striking resemblance between oxalic acid and epsom salt is well known.

4. The microscope is of use in examining for vegetable poisons, such as nicotine, morphine, strychnine, etc.

II.—USE TO PHYSICIANS.

The microscope can be used as an aid to the physicians living in the same place. The druggist owning the microscope might have a schedule printed, stating the price he would charge for making certain examinations, and send this to each of the physicians of the place; thus acquainting them with the fact that such work can be done at their own homes. This work might consist in the examination of the secretions, as urine, etc.; of abnormal growths, as tumors, etc.; of normal substances, as blood, sputum, etc., and in the examination of skin diseases.

III.—USE TO LAWYERS.

Only rare chances would occur where the lawyers of the place would want any work done with the microscope. Still, cases might come up where even the lawyers would want examinations made of signatures or ink marks, blood stains, hair, wool, etc.; or to determine the composition of paper or fabrics.

IV.—PRICE OF MICROSCOPE.

It is generally thought that a microscope of sufficient power to do the work of the pharmacist is, to say the least, an expensive luxury. But such is far from the truth. There are several dealers in optical goods who will furnish complete outfits for such work as we have mentioned at a price varying from thirty-five dollars to seventy-five dollars. The firm of Bausch & Lomb, of Rochester, N. Y., advertise a "student's" microscope which, complete with a one inch and a one-fourth inch objective, can be purchased for about thirty-five dollars. Their "physician's" microscope, complete, as listed at sixty-five dollars, is a model instrument and will do all the work required of either the pharmacist or physician.

Query No. 36.

By what method can Medicinal Phosphoric Acid be estimated Volumetrically?

By B. W. Cheever and E. R. Beal.

The volumetric determination of phosphoric acid is attended with several difficulties not met with in other acids. Phosphoric acid being a tribasic acid is capable of forming three classes of salts; each of which may have its own distinct and characteristic reaction toward an indicator, as acid, neutral or alkaline, while sometimes, different indicators give different reaction with the same salt.

But, having determined the form of salt, which gives a neutral reaction with any indicator, there would be no difficulty in titrating the acid with a standard alkali, if the acid were chemically pure; however, the action of the sodium salt present, toward indicators, must ever be borne in mind in titrating for free acid.

According to J. Bongartz, (*Chemical News*, 51–123,) if free phosphoric acid to which methyl orange has been added, is titrated with a solution of potassium hydrate until the orange red color is changed to a pale yellow, diacid potassium phosphate is formed, from which the free phosphoric acid may be calculated.

If now phenolphthalein is added, and the potassium solution run in until the red color is produced, we have monoacid potassium phosphate, (K_2HPO_4).

To prove the above statements, some pure phosphoric acid was prepared by oxidising phosphorus with nitric acid, according to the U. S. Ph. method. This acid was then diluted till, with an equal amount of decinormal solution of sodium hydrate, it gave a neutral reaction with phenolphthalein.

$$(H_3PO_4 + 2NaOH = Na_2HPO_4\,2H_2O).$$

On adding methyl orange to the diluted acid, and then, from a burette, decinormal solution of sodium hydrate, it required just one half as mch of the alkali solution as of the acid taken

to produce a neutral reaction, ($H_3PO_4 + NaOH = NaH_2PO_4 H_2O$). An experiment showed that a solution of disodic hydric phosphate (Na_2HPO_4) was neutral to phenol, and since it required just one half as much alkali to make the pure acid neutral to methyl orange, it follows that the form of the salt neutral to the latter indicator is the monosodic hydric phosphate (NaH_2PO_4). To prove that the amount of phosphoric acid obtained from the above titrations was correct, two gravimetric determinations were made. The ordinary method of precipitating the phosphoric acid from a strongly ammoniacal solution with magnesia mixture, and weighing as magnesium pyro-phosphate ($Mg_2P_2O_7$) was the one used, twenty cubic centimeters of the acid were taken for each estimation, and each time .072 Gm. of phosphoric anhydride (P_2O_5) were obtained; while from the same amount of each by titrating, .0774 Gm. were found, or .0053 Gm. more than by the gravimetric method.

It should be stated that the above gravimetric method is not strictly accurate, since the magnesium ammonium phosphate ($MgNH_4PO_4$) formed is slightly soluble in the dilute ammonia water, with which it is washed to remove the magnesia mixture; hence the volumetric result was doubtless more nearly the true amount than the gravimetric.

The accuracy of the method in the presence of sodium was proved by mixing definite amounts of the phosphoric acid and disodic hydric phosphate and titrating the mixture with standard sodium hydrate, using methyl orange and phenolphthalein, as previously stated.

Process: for determining the per cent. of FREE PHOSPHORIC ACID; add methyl orange to the acid and then titrate with a standard solution of sodium hydrate, until the orange red color is changed to a pale yellow; reaction (NaH_2PO_4, H_3PO_4) $+ NaOH = 2NaH_2PO_4, H_2O$.

If, now, phenolphthalein be added, and the titration continued to the neutral point of this indicator, the difference between the results obtained with methyl orange and phenolphthalein will be the phosphoric acid in combination with sodium as NaH_2PO_4, while the result of the second titration gives the total amount of phosphoric acid present.

Volunteer Paper.

Alkaloidal Strength of Ipecac and its Fluid Extract.

By H. W. Snow, Ph. C.

In tracing even in a cursory manner the results of the chemical examination of ipecac root from the discovery of its alkaloid, emetine, in 1817 by Pelletier & Magendie, down to the present date, one is immediately struck with the great diversity of opinion which is held regarding its constituents. The subject is one attended with many difficulties but, collective investigations and accumulated experience will in time solve the problems involved, and it was with a view of adding my own experience to the sum total and thus assisting in the work that this paper was prepared. The study of ipecac root has been made by many chemists of ability, but even as yet there are many points of obscurity connected with it particularly in regard to the amount of alkaloid actually contained in it and the true chemical formula of the alkaloid.

Pelletier is said to have obtained from the root as high as 16 per cent. of an impure salt of emetine; Leprat speaks of 6 and 7 per cent. as being present; Flückiger* finds a much smaller amount, viz.: about 1 per cent., this being the result of a considerable experience in the assay of the drug, and he says unhesitatingly in his Pharmacographia that higher amounts are only obtained by defective methods of analysis. His results were obtained chiefly by weighing the alkaloid and the details of the method are well known. Podwissotski† in 1880 declared ¼ to 1 per cent. to be a fair average. Zinoffsky and Dragendorff using Mayer's reagent have found as high as 3.75 per cent. of the alkaloid though by methods of extracting the emetine with chloroform, after its liberation by barium carbonate Dragendorff was unable to obtain the full amount of alkaloid indicated by

* Amer. Drug. from Pharm. Zeitung, January, 1886.

† Year Book 1880-81, from Pharm. Zeitschr. für Russland, 1880, No. 1.

titration. The loss was attributed to decomposition of the alkaloid by the alkali used in setting it free. T. M. Stewart * determined the emetine in eight samples of ipecac with a maximum of 2.10 per cent. and an average of 1.84 per cent. The determinations were made by the Zinoffsky-Dragendorff process, and he also stated that methods by weighing had given him practically identical results. Unfortunately the method used in obtaining the alkaloid in a form for weighing was not stated.

Lefort † regards 1½ to 1 per cent. as the true amount, determined by means of the insoluble tannate. And nearer at home we find A. B. Lyons ‡ supporting the view of an alkaloidal content of the root exceeding 2 or 2½ per cent., determined partly by Mayer's reagent and partly from assays by weighing the alkaloid.

It will be seen that the highest amounts have been obtained by the method of titration, while all who have attempted to separate and weigh the pure alkaloid have obtained much lower percentages.

Those who estimate the alkaloid by the weight contend that the high results shown by Mayers' reagent are unreliable and believe that ipecac must contain substances which are precipitated by that reagent other than the emetine. The alkaloid is an exceedingly sensitive one to the action of alkalies, as every one will conclude who has made many experiments with it, and the writer will show in figures later on something of the loss which occurs in treating it with ammonia. Jones § has also shown experimentally that calcium hydrate decomposes the alkaloid. This sensitiveness of the alkaloid to the action of alkalies is an extremely important one, and is the chief objection to any method of weighing. There is no difficulty whatever in obtaining the alkaloid in a pure form for weighing, but to obtain it *all* without loss or decomposition is a very different matter.

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* Amer. Jour. of Phar. 1876-359.

† Amer. Jour. of Phar., 1869, from Jour. de Pharm.

‡ Proc. Mich. State Pharm. Ass., 1885.

§ A paper read before the British Pharm. Conf., 1886.

MAYER'S REAGENT IN THE ESTIMATION OF EMETINE.*

In experimenting upon Merck's pure white emetine Mayer's reagent is found to give fairly satisfactory results. The amount of reagent required varies with the extent of dilution to a limited extent, but when its value is once determined for the alkaloid in different degrees of dilution, we may reasonably expect to show quite closely the amount of alkaloid in ipecac root, provided the root does not contain substances not alkaloidal in nature, which are precipitated by that reagent. The following figures were determined with Merck's emetine, ("pure white"):

	1 c c of the reagent = in grams.
1 part in 200	.0109
1 part in 300	.0105
1 part in 400	.0102
1 part in 500	.0100
1 part in 600	.0095

Trials on the emetine separated from the root at different times have not shown very different results from the above, but give perhaps slightly lower results. Based on these figures, the following tables were constructed to aid in interpreting the results of titration:

TABLE A.

(The fluid measures 50 cc. at the beginning of the titration.)

cc. of Mayer's Reagent used.	State of Dilution.	Value of 1 cc. of Mayer's Reagent.
5.3	1 part in 600	.0095
6.0	1 part in 500	.0100
7.35	1 part in 400	.0102
9.5	1 part in 300	.0105
13.8	1 part in 200	.0109

The method of using the tables is best indicated by an example. Suppose 7 cc. of reagent were required to precipitate the alkaloid. Running down the left hand column, 7.35 cc. is found, (as being the nearest amount to 7 cc.) Immediately opposite 7.35 cc. is noted that it indicates the alkaloid to be in the proportion of 1 part in about 400 and we then take .0102 as the

*The Mayer's reagent used by the writer is the 1-20 normal solution, not the original decinormal solution of Mayer.—[Ed.

proper equivalent to use in calculating the amount of alkaloid. Suppose, instead of 7 cc. of Mayer's reagent that 8.4 cc. had been required to precipitate the alkaloid. In looking down the left hand column we find that this amount is not far from half way between 7.35 cc. and 9.5 cc., and that the dilution of the alkaloid is between 1 part in 300 and 1 part in 400. It would be justifiable, and not far from right, to strike an average between the equivalents for 1 part in 300 and 1 part in 400, viz: .0103 and use that equivalent for obtaining the amount of alkaloid. If the fluid measures 45 cc. at the beginning of the experiment, then table B may be used in the same manner as the preceding. It is my habit to use mostly table B, but when the amount of alkaloid is small table A would serve better.

TABLE B.

(The fluid measures 45 cc. at the beginning of the tritration.)

Cc. of Mayer's Reagent used.	State of Dilution.	Value of 1 cc. of Mayer's Reagent.
7.9	1 part in 600	.0095
9.0	1 part in 500	.0100
11.0	1 part in 400	.0102
14.3	1 part in 300	.0105
20.6	1 part in 200	.0109

In looking over these figures it is evident that in interpreting the results of titration by Mayer's reagent higher results will be obtained than have generally been shown. In the first place, .0095 is the equivalent which has been generally used for the $\frac{N}{10}$ reagent, this being the amount determined experimentally by Zinoffsky* though the degree of dilution was not stated. But titrations have generally been made in solutions 8 cc. of which represent 1 gram of drug, while, according to my experiments, .0095 is about correct, for the alkaloid in 1 part in 600 of water, in which case 20 cc. of water should be used for each gram of drug, and a correspondingly larger amount of reagent is required to precipitate the whole of the alkaloid. As an average of four determinations, I have found that 100 milligrams of alkaloid yield a precipitate which weighs 0.245 milligrams, or the precipitate contains 40.81

* Chem. and Drug., April, 1872.

per cent. of emetine. These results are not far from those of A. B. Lyons,* who finds that the precipitate from 100 milligrams runs between 240 milligrams and 256 milligrams, or averaging about 248 milligrams.

Using Mayer's reagent to determine the alkaloid in ipecac root after the Zinoffsky–Dragendorff process, except that the fluid from 2½ grams of root is diluted to 45 cc. instead of 20 cc. I have found easily from 2½ per cent. up to as high as 4 per cent., and would consider it a poor ipecac root which fell below 3 per cent. In endeavoring to extract an amount of alkaloid approaching the amount shown by the reagent, I have not succeeded any better than those who have preceded me in the attempt. The nearest I have yet come was in a root shown by titration to contain 2.8 per cent. emetine, 2.56 per cent. was obtained by weighing; this result being with process 1, given further on. But the same method was not so satisfactory when tried on other samples. Using a modification of process 1 on fluid extracts, much better results were obtained, though at no time were practically identical results obtained; thus, in six comparative experiments instituted, an average of 1.45 per cent. was obtained by titration, while 1.16 per cent. was the average found on weighing, there being a loss on an average, supposing the higher results to be correct, of about 13 per cent. of the alkaloid. † In trying a method of precipitation with platinum chloride, results were obtained, favoring the results obtained by Mayer's reagent.

WEIGHING THE EMETINE.

As is well known, emetine is extremely prone to decomposition and especially when in contact with alkalies. The pure alkaloid, though white is rarely found so in commerce, and upon exposing the best qualities of the commercial article (nearly white) to the air and sun, it begins to darken; upon heating, the change is much more rapid, and when the temperature rises above 75 degrees centigrade, the alkaloid melts and turns brown. With a view of expressing numerically the

* Amer. Jour. of Phar., Jan., 1887, from Proc. Mich. State Pharm. Ass., 1886.
† See results of Ammonia on Merck's emetine.

amount of decomposition which would be apt to take place during isolation, Merck's pure white emetine was taken, and after dissolving in a small amount of *dilute* sulphuric acid, the solution was still further diluted, the alkaloid set free by ammonia, and was then washed out by successive portions of chloroform, and the aqueous stratum of liquid finally tested with Mayer's reagent, to be sure that the alkaloid had been wholly withdrawn; this precaution, whenever necessary, was observed throughout. The mixed chloroformic solutions being too bulky for convenience, were then evaporated to something less than half its original bulk. From the chloroform the alkaloid was withdrawn by acid. After making alkaline a second time and washing out the alkaloid with chloroform, the chloroform was evaporated, and the alkaloid, after drying, was weighed. A loss of 13.3 per cent. of alkaloid was found to have been sustained. A repetition of the above process was made with the alkaloid still remaining, and in the second instance 13 per cent. was lost. This shows how extremely easy it is to lose notable amounts of the alkaloid in the process of extraction. In extracting the alkaloid in the comparative experiments with Mayer's reagent, only two processes of any consequence were tried, but both of these were known to give good results with many drugs containing alkaloids.

PROCESS I.*

Five grammes of the root in *fine* powder are placed in a flask of 100 cc. capacity; 85 cc. of chloroform are then poured over it, and after shaking vigorously for a few moments, 15 cc. of strong alcohol containing ½ cc. of stronger water ammonia are introduced and again shaken vigorously. The flask is then set aside for several hours with occasional shaking. An aliquot part of the chloroformic solution is taken for the further purification of the alkaloid. I am inclined to think that this process, with the drug in *very fine* powder (No. 80 or finer), and not allowing the maceration with the solvent to extend beyond two

* Recommended by A. B. Lyons for the assay of Nux Vomica. Dr. Lyons has also used ammoniated solvents for the assay of Ipecac.

hours (comparative experiments show that that time is sufficient) will give about as good results as any method of weighing which is at present known. With coarse powder, however, and longer maceration, it has not given as much satisfaction as under the circumstances first mentioned.

PROCESS II. *

Five grammes of Ipecac root in fine powder are placed in a wide mouthed flask, 100 cc. of a mixture of chloroform, two volumes and strong alcohol, one volume are poured over it. The weight of the flask and contents is then taken. The flask is now fitted with an inverted condenser and the mixture kept at a slight boil for three to four hours; after cooling replace the solvent lost by volatilization, which should be small in amount, an aliquot part is employed for further operations.

PROCESS III.

Employed only to a limited extent by the writer and found to be only partially successful. Treat the drug first with water then with alcohol as in Zinoffsky's method. Evaporate an aliquot part of the solution with litharge, pour over the litharge mixture a known volume of chloroform, and after 24 hours digestion with frequent shaking, evaporate an aliquot part of the chloroform, dry the emetine and weigh.

FLUCKIGER'S METHOD.

Flückiger† recommends a process which consists of an exhaustion of the root with hot chloroform containing a small amount of ammonia in a continuous extraction apparatus, evaporating the chloroform and weighing the emetine. Before this he had mixed the root with milk of lime, evaporated, then treated with chloroform and the chloroform solution upon evaporation yielded the alkaloid in a form for weighing. His later process does not differ essentially from process No. 1 given above, but has the

* Practically the same process as that employed by Dunstan & Short, for the assay of nux vomica, and found to give satisfactory results with Belladonna Root, by Dunstan & Ransom.

† Amer. Drug. from Pharm. Zeitung, January, 1886.

disadvantage of prolonged heating with the alkaline solvent. The writer did not think it necessary to try it in view of having used the first method.

Even by methods of weighing I have found higher amounts of alkaloid than is ordinarily reported. The number of assays made by me by weight is rather limited in number and mostly made for comparison with the assays made by Mayer's reagent. I find a number recorded as follows: 2.66, 2.48, 2.96, 2.4, 1.76, 2.48, 2.68 and 2.56 per cent. The estimates were made sometimes with one, sometimes with another of the three processes already given, though the ammoniated chloroform was used most and has given the highest results. By weighing, 2 to 2½ per cent. of alkaloid should be obtained from a root of good quality. In a number of instances the purity of the alkaloid obtained for weighing was checked by Mayer's reagent. Any considerable impurity would have been detected without trouble and further, the alkaloid always dissolved with perfect readiness in water slightly acidulated.

ESTIMATION OF EMETINE BY MEANS OF PLATINUM CHLORIDE.

Platinum chloride precipitates emetine in common with other alkaloids. The precipitation is so complete when an excess of the precipitant is used that upon filtering, taking the filtrate without washing and removing the platinum with sulphuretted hydrogen, then warming to free the solution from the latter gas, the aqueous solution so obtained will give no precipitate with potassium-mercuric iodide.

Various text books * give 29.7 per cent. as the amount of platinum contained in the precipitate The writer did not find this to be the case. A number of determinations show that 21 per cent. is much nearer the truth. 100 milligrams of emetine when dissolved in a few drops of weak hydrochloric acid and then diluted to about 40 cc., yield a precipitate which after a limited amount of washing, then ignited strongly, will leave 0.0312 grammes of metallic platinum. The precipitate is

* Lyon's Manual of Pharmaceutical Assaying from Dragendorff's Plant Analysis, Eng., Ed. 1884.

decomposed by much washing and the operator must use a limited amount of wash water and direct it rather to the filter paper than the precipitate. Neither does it seem to be constant in composition as determinations of the amount of platinum in the dried double chloride which after precipitation had been liberally washed to free from all incombined platinum, have been found to show varying amounts of platinum upon ignition. It is possible and quite probable, however, that these discrepancies are due mostly to the decomposing effect of prolonged washing, and that the composition of the precipitate at time of throwing down and while there is an excess of platinum chloride present, is sufficiently constant for practical purposes. Authorities say that the precipitate with platinum chloride is less soluble in alcohol than in water, and this again the writer did not find to be the case. The method adopted in determining the alkaloid in the root was to macerate first in water, then with alcohol as recommended by Dragendorff.

Take an aliquot part of the filtrate, and, after evaporating the alcohol, treat the residue with a little dilute hydrochloric acid, then dilute with water and filter, wash the precipitate until the washings give no precipitate with platinum chloride. This is generally accomplished without much difficulty, as the residue though fatty and somewhat inclined to clog the filter, nevertheless gives the alkaloid up easily. To the filtrate platinum chloride is added as long as a precipitate is produced. After allowed to stand for a few hours, filter through a paper the weight of the ash of which is known. In transferring the last portions of the precipitate to the filter paper it is advisible to use the clear filtrate in order to avoid an excess of fresh water. Two or three washings are sufficient. After ignition deduct from the total weight the weight of the ash to get metallic platinum. And the weight of the platinum divided by 0.312 will give the amount of alkaloid in milligrams.

Using this method in a number of comparative assays with Mayer's reagent, the evidence has been about equally divided for and against the results obtained by titration.

Number of the Sample.	Result by Mayer's Reagent.	Result with Platinum Chloride
* 1	1.74	2.00
* 2	2.40	2.3
* 3	1.59	1.73
* 4	2.08	2.21
5	3.68	3.78
6	4.36	3.00
7	3.22	2.24
8	2.23	2.95
9	4.36	2.24

In some instances, notably, 6, 7 and 9, very different results were obtained by titration from those obtained by platinum chloride.

I have not employed platinum chloride to a sufficient extent to know its full value, and trustworthiness, but think that it is no more liable to error than most of the processes for the assay of ipecac, in present use. It is not easy to explain why such *wide* differences should occur in *some* instances, between its results and those obtained with Mayer's reagent. The method is free from liability of decomposition of the alkaloid; but it may be urged that the presence of potassium salts will affect the results, or that the precipitate is of uncertain composition. In summing up these results, it will be seen that nothing very positive has been determined as regards the reliability of the Zinoffsky-Dragendorff process of assay for ipecac. Evidence is about equally divided. It sometimes looks as though amongst the different varieties of ipecac to be found in commerce, some at least contain a constituent non-alkaloidal in nature, which gives a precipitate with Mayer's reagent. All the experiments indicate the presence in ipecac of at least $2\frac{1}{2}$ per cent. of alkaloid as an average.

LIMIT OF TESTS BY GENERAL ALKALOIDAL REAGENTS FOR EMETINE.

During the course of the experiments, the writer has taken occasion to determine about the limit at which the various reagents would precipitate emetine. The amounts given below are not strictly the limit, but are dilutions where a faint

* Fluid Extracts.

opalescence makes its appearance at once, or within a moment or two after the addition of the reagent; doubtless many of them would give precipitates in still greater degrees of dilution by being allowed to stand 15 or 20 minutes.*

Reagent.	Precipitates. one part of Alkaloid in
Mayer's Reagent	200000
Sodium Phosphomolydbate	60000
Iodine in Potassium iodide	200000
Sodium Phosphotungstate	40000
Picric Acid	18000
Chloride of Gold	21000
Chloride of Platinum	8000
Potassium Bismuth Iodide	25000 †
Potassium Cadmium Iodide	25000 †

FLUID EXTRACT OF IPECAC.

Most of the assays made of fluid extracts have been with Mayer's reagent; a limited number of comparative assays have been made, however, by weighing, and with platinum chloride. In titration I have usually made up a dilution of 9 cc. for every cc. of fluid extract employed and interpreted the results by means of table B, already given. Assays made by weight are most satisfactorily made by evaporating with pumice stone and then applying either process 1 or process 2, which have already been given for the root, using only about 1 hour's digestion in either case. Washing out the alkaloid direct from the diluted fluid extract is not satisfactory, and a large amount of solvent is often required. This is a general fact, and is the case in with-

*From some hitherto unpublished notes, I give here for comparison the results of a series of observations made by myself a year or two ago.—[Ed.

Reagent.	Limit of reaction.
Mayer's reagent	1 : 25,000
Tannin	1 : 25,000
K I + I	1 : 25,000
K Br. + Br	1 : 25,000
Phosphomolydic acid	1 : 12,500
Picric acid	1 : 12,500
Gold chloride	1 : 6,400
Platinum chloride	1 : 6,400
Potass. bichromate	1 : 5,000
Potass. carbonate	1 : 2,000

† According to Pander, Watt's Dictionary, Vol. vii-466, from Chem. Centralblatt, 1872-440.

drawing many alkaloids from complex fluids. Assays run as follows:

Number of Sample.	Per cent. by Weighing.	Per cent. by Mayer's Reagent.	Per cent. by Platinum Chloride.
1	1.28	1.51	....
2	0.72	0.97	....
3	0.96	1.38	....
4	0.84	1.11	....
5	1.52	1.76	....
6	1.66	2.00	....
7	0.92(?)	1.64	....
8	2.56	2.80	....
9	....	1.74	2.00
10	....	2.40	2.30
11	....	1.59	1.73
12	....	2.08	2.21
13	....	1.14	....
14	....	1.50	....
15	....	2.70	....
16	....	1.65	....
17	....	2.21	....

A good quality of fluid extract should assay 2 per cent. by Mayer's reagent, or 1¼ per cent. by a good method of weighing. The products above given are from six manufacturing houses, but the larger portion come from two concerns.

ALCOHOLIC STRENGTH OF COMMERCIAL FLUID EXTRACTS.

As a matter of interest, the alcoholic strength of the fluid extracts of ipecac from five well known manufacturing houses, was determined, with results as follows:

A	contains	Alcohol	57.06	per	cent.	by	vol.
B	"	"	29.58	"	"	"	"
C	"	"	21.39	"	"	"	"
D	"	"	42.67	"	"	"	"
E	"	"	34.04	"	"	"	"
U.S.P.	"	about	47.00	"	"	"	"

The U. S. P. exhausts with strong alcohol, but during the course of finishing, the strength is reduced to about 47 per cent. by volume. Probably this is the case with many of the manufactured fluid extracts of ipecac.

EMETINE.

A number of formulas have been assigned to emetine, the three principal ones are that of Reich (1863), $C_{20}H_{30}N_2O_5$; that of Glenard (1875), * $C_{30}H_{44}N_2O_4$ and that of Lefort & Wurtz † $C_{28}H_{40}N_2O_5$. Emetine, according to Podwissotski ‡ is readily soluble in cold ether, chloroform, acetic ether, amylic and methylic alcohols, ethylic alcohol of all strengths, carbon di-sulphide, volatile oils, and to a considerable extent in olive oil and other fats, and in oleic acid. It is scarcely soluble in cold water, 1000 parts of which very slowly dissolve one part of emetine. The salts are readily soluble in alcohol, water and fatty oils, and are insoluble in ether, petroleum, naptha, benzole, etc. With tannic acid, emetine forms a precipitate nearly insoluble in water, but its compounds with gallic acid are readily soluble in water.

* Rep. de Pharm. in Year Book, 1878-94.

† Jour de Pharm. et de Chem. in Year Book, 1876-90.

‡ Amer. Jour. of Pharm., 1880-207 from Pharm. fur Russland.

Query No. 9.

What Proportion of Quinine does Commercial Citrate of Iron and Quinine contain.

By E. C. Federer, Ph. C., Detroit, Mich.

This query would seem to indicate that the U. S. P. citrate of iron and quinine was not intended to be examined, for there are two varieties of citrate iron and quinine on the market; the green scales or soluble kind and strictly U. S. P., and the more difficultly soluble kind. By far the largest amount sold and used is the former. The U. S. P. requires the citrate of iron and quinine to contain 12 per cent. quinine as alkaloid and that it should contain no ammonia or ammonium salt. This form of salt is intended, first on account of the scale being better adapted for the pill mass and the more permanent character of the pills made from it, and next, the salt is much less bitter in taste than the soluble salt; this is obvious on account of difficult solubility.

Probably the soluble kind is the more popular for the reason that it is more readily manipulated in fluid preparations, elixirs, etc., and manufacturers obey the demands of trade. Ready made, variously coated pills are now manufactured on the large scale by numerous houses at a comparatively low figure. The dispenser finds it economy to buy these, rather than to make them himself, and so has comparatively little use for the insoluble official article.

The soluble kind of the scale salt not being the official salt might be held to justify the manufacturer or at least offer him a loop-hole for excuse, in case deficiency were found in the percentage of quinine found in these samples, although the labels generally claim the full U. S. P. proportion of quinine.

Nine separate ounces in original bottles from different prominent manufacturing chemists were obtained. All but one (No. 1) was found to be in greenish scales, very soluble, and contained ammonia which demonstrates itself in that part of the assay

(U. S. P.) where excess of liq. soda is used in liberating the alkaloid or alkaloids, the ammonia gas being evolved and becoming very apparent by its pungent odor.

The exceptional one (No. 1) on the list (see table) was in deep garnet scales and gave off no ammonia, besides it was quite difficultly soluble compared with the others.

They were all assayed by the U. S. P. process and the circumstances for each made as uniformly alike as to heat, etc., as possible; drying was done in hot air to constant weight; the heat never exceeded 210° F. nor went lower than 190° F.

The residue left from the chloroformic solutions was further assayed (U. S. P.) for purity of quinine alkaloid, in accordance with the following test of the U. S. P. "If 1 gm. of quinine be mixed in a mortar with 0.5 gm. ammonium sulphate and 5 cc. water (distilled), the mixture thoroughly dried on the water-bath, the residue (which should be neutral to test paper) agitated with 10 cc. distilled water and macerated at 59° F. for ½ hour, then filtered through a small filter, 5 cc. of the filtrate taken in a test tube and 7 cc. water of ammonia sp. gr. 0,960 then added,—on closing the test tube with the finger (clean) and gently turning it until the ammonia is fully intermixed a *clear* liquid should be obtained. If the temperature of maceration has been 16° C. (60.8° F.), 7.5 cc. of ammonia may be added; if 17° C. (62.6° F.), 8 cc. may be added. In each instance a clear liquid indicates the absence of more than 1 per cent. of cinchonidine or quinidine, and of more than traces of cinchonine."

No. 8 on the list contains the least alkaloid and the chloroformic solution (from assay experiment) from this specimen presented a very dark appearance, dark reddish brown; the residue by evaporation was also very dark brown (nearly black), the assay for purity of alkaloid gave with the U. S. P. (9.60 sp. gr.) ammonia a *curdy* voluminous precipitate yellowish brown at first, becoming darker in a few minutes, its alcoholic or weak acid solution was very bitter and it behaved only moderately like quinine in the thalleioquine test, in all probability it consisted of the amorphous alkaloids of cinchona bark, (*Chinoidin*). The theory may possibly be advanced that it was really quinine

altered by excess of heat; but this is not tenable, because in no case was the heat allowed to register more than 210° F., and all the other samples with like manipulation formed *colorless* chloroformic solutions, their residues from evaporation were only slightly yellowish at the edges of their mass. The preparation was in very handsome scales of a light greenish yellow, very soluble and bitter; probably if they had used 12 per cent. of the amorphous alkaloids (chinoidin) they would have their beauty destroyed by the large amount of black chinoidin.

No. 5 is labelled "U. S. P. strength Quinine, *no* ammonia," this salt is in greenish scales, gives off ammonia gas with the liq. sodæ and is very soluble.

Summary of results:

	Labels on bottles claim:	Found percentage quinine.
No. 1	Nothing specified.....	9.2125 p. c.
" 2	English style; contains off'l amount quinine..	11.5 "
" 3	Full strength U. S. P. quinine..... ...	10 "
" 4	Soluble; contains full U. S. P. amount quinine	12.35 "
" 5	12 per cent. quinine; *no ammonia*	10.85 "
" 6 ...	Full off'l quantity pure quinine.....	10.25 "
" 7	U. S. P. quinine strength.....	12.5 "
" 8	Nothing specified	2.75 "
" 9	Full off'l quantity pure quinine.....	11.5 "
"	Standard U. S. P.....	12.0 "

The following are the tabulated results of tests for the purity of the alkaloid (U. S. P. test):

No. 1	Opalescent mixture.
" 2	Quite cloudy.
" 3	Clear solution.
" 4	Milky then clear.
" 5	Cloudy mixture.
" 6	" "
" 7	Very slightly cloudy mixture.
" 8	Curdy, voluminous precipitate (becoming dark.)
" 9	Very slight cloudiness.
"	Clear solution.

Volunteer Paper.

What is the Strength and Purity of Spirit of Nitrous Ether of the Market?

By Geo. B. Topping, Ph. C.

The following is an analysis of 27 samples, most of which were obtained from retail pharmacists throughout the State.

No. 26 was made by the writer, carefully following the U. S. P., and assayed shortly after making. No. 27 was made by the writer, according to H. B. Parson's modification of U. S. P. method. New Rem., Vol. xii., page 259.

The ethyl nitrite was estimated according to the method of A. H. Allen. *Ph. Jour. and Trans.*, [3] Vol. xv., page 673.

The tests for acid and aldehyde were applied according to the U. S. P.

No.	Manufacturer.	Acidity by $KHCO_3$	Aldehyde	Sp. Cr.	Ethyl Nitrite Per ct.
1	Made in Laboratory, Spring 1887,	None	None	.8167	1.48
2	By writer, August, 1886, U. S. P.	"	"		1.16
3	Made from Schieffelin's Con. Ether	"	"	.820	1.67
4	" " " " "	"	"	.819	1.166
5	" " Concent'd, make unknown	"	"	.821	1.35
6	" " Mallinckrodt's Con.	Slight	"	.8676	2.129
7	" " " "	None	"	.821	4.172
8	Specimen 7–8 year old	Slight	Slight	.929	None
9	Made from Schiefflin's Con. Ether	"	None	.884	1.54
10	" " " " "	None	"	.819	1.89
11		"	"	.811	1.66
12	Made from Eberbach's Con. Ether	"	"	.822	3.56
13		Eff.	"	.929	None
14		"	Slight	.949	3.35
15		None	None	.821	None
16	Made from Schiefflin's Con. Ether	"	"	.854	4.85
17		Eff.	Slight	.939	None
18		None	None	.824	2.41
19		Eff.	"	.868	8.66
20		None	"	.822	2.34
21		Eff.	Pres.	.928	None
22	Made in Laboratory, Spring, 1887	None	None	.823	4.67
23	" " " " 1885	"	"		None
24	" by Mr. Kidder, 1887	"	"	.821	2.79
25	" from Mallinckrodt's Con., fresh	"	"	.823	4.44
26	" by writer, fresh, U. S. P.	"	"	.820	2.82
27	" " " Mod., U. S. P.	"	"	.818	3.52

Query No. 4.

A quantitative determination of the Mineral Constituents of the Water of Lake Superior is desired.

By W. F. Jackman, Ph. C.

A strict adherence to the title of the present paper would exclude any reference to organic matter, dissolved gases, or similar determinations, such as are common and of importance in sanitary examinations of water; nevertheless a few of the results of a partial examination for organic matter are submitted, but the great length of time that elapsed after collection of the sample before it could be analyzed decided it to be useless to estimate dissolved gases. This delay renders, of course, the determination of free and albuminoid ammonia, and of "oxygen consumed" by Kubel's permanganate process, also of very little worth probably; but the results are submitted for what they may be worth and as of possible interest.

The sample for analysis was obtained during the summer of 1886, by Captain Mooney of the steamship India, about 50 miles from Keweenaw Point, and at a depth of 50 feet; and was sent to the University Laboratory in a large carboy. There was also secured at the same time with this sample a sample from Lake Huron, which it is regretted certain considerations compelled to be laid aside unexamined.

The analysis of the sample of Lake Superior water was not made until the latter part of December and first of January following its collection. Although the carboy contained over 18 litres of water; yet the small amount of inorganic solids (only 57.61 mg. per litre) rendered this seemingly large amount of water really small for all the necessary estimations and duplicates, so that economizing of material had to be studied from the very first.

As to methods followed, it has not been thought desirable to cumber unnecessarily the present article with a minute

account of them when the methods followed were those well know and commonly used; but when the manipulations differ in any way from the customary processes, they are stated more in detail. Perhaps one of the most noticeable changes followed in the present work was in the frequent use of NH_4F and ignition (in platinum crucible, of course) *after* the usual final weight taken in gravimetric work,—and the whole then reweighed,—and this last weight taken as the true one—the first weight simply as a check.

With the fact of the slight solvent action on glass or porcelain of large quantities of boiling liquids—even of distilled water—all are familiar; but this is generally ignored as an insignificant amount. That it really becomes an important factor in work such as the present (involving large quantities of water with very small residues) Thorpe, Fresenius, and others have shown by definite experiments. In the present work the correction necessary from this cause was generally inconsiderable, but not always,—e. g. in determinations of Mg, one sample weighed as $Mg_2P_2O_7$ gave 48.3 mg. *before* ignition with NH_4F, while *after* such ignition it weighed only 41.6 mg.—a loss of 6.7 mg. Another sample of $Mg_2P_2O_7$ lost 5.2 mg., in both cases from three litres of water. Of course, care was taken that loss did not occur from the crucible being uncovered, or from spurting through sudden application of heat, etc. In estimation of H_2SO_4 (as $BaSO_4$) after ignition to expel slight excess of NH_4F, and the SiF_4 formed, the residue was treated with a drop of H_2SO_4 and reignited. In the case of Al_2O_3 and Fe_2O_3 estimation there is generally present a small amount of SiO_2 which has escaped separation in its usual place; hence the SiO_2 found here was added to the total SiO_2, obtained in the regular estimation of that constituent. This SiO_2 found with Al_2O_3 and Fe_2O_3 may properly be thus regarded as wholly belonging to total SiO_2 of the sample, as very little liquid is operated on *after* the regular separation of SiO_2 before the separation of Al_2O_3 and Fe_2O_3 takes place.

Evaporation was carried on in broad, shallow, half-litre porcelain dishes, covered with a funnel of special design, with an incurved rim, made to set snugly (but unfortunately not air-tight) upon the rim of the evaporating dish.

[I say *unfortunately* not air-tight, for Mallet has shown that the flame of the Bunsen burner in time produces quite appreciable amounts (when fine work is considered) of $(NH_4)_2SO_4$, and that unless the evaporating dish is kept tightly covered, danger of error from this cause is likely to occur. (See Mallet's Report on Water Analysis in the Report of National Board of Health, 1882, p. 194, where he shows that nitrogen determinations by Frankland's combustion process, as ordinarily conducted, give too high results from this cause. Mention of this is made here only to indicate that this might possibly somewhat affect the determination of H_2SO_4.]

To the nozzle of the funnel was attached a rubber tube, connected with a water suction pump. This served to create a rarefaction above the evaporating water, thereby increasing the rate of evaporation, and permitting the use of lower temperature. Any steam failing to pass off through the pump, because of condensation on sides of the funnel, could not run back into the dish, but was caught by the incurved rim of the funnel. Extraneous particles of dust, etc., were also thus excluded. When total solids were to be estimated evaporation was in no case continued to dryness; but the liquid concentrated to about 200 cc. was carefully transferred in portions to a large platinum evaporating dish, with subsequent thorough rinsing with distilled water, the whole evaporated to dryness, dried in the air-bath at 100° C. for three hours, cooled in a desiccator over H_2SO_4, and weighed for *total solids*. Five such determinations were made. This residue was ignited at low red heat for about two hours to constant weight, cooled and weighed as *total inorganic solids*. In a few cases this latter residue was treated with $(NH_4)_2CO_3$ in solution re-heated, and weighed again; but the increase averaging only 0.6 mg. per litre this operation was subsequently neglected; although account was taken of it in final results.

Difference between total solids and inorganic solids equal roughly *organic matter*.

QUALITATIVE WORK.

One and one-half litres concentrated by evaporation, transferred to platinum dish and evaporated to dryness, weighed,

ignited and weighed again, as described above, for *total solids* and *inorganic solids*. The residue was then examined qualitatively by the usual methods, with good tests resulting for Al, Fe, Ca, Sr, and Mg (rather fainter test). The flame test showed Na but no K, which occasioned some surprise. Through the kindness of Professor Langley the aid of his spectroscope and experienced eye was secured to identify any of the rarer metals that might be present,—it being thought that Li at least might be present; but nothing was found but what had been already identified, except that faint, evanescent flashes of K were seen.

Thinking the previous estimation of total solids and consequent protracted ignition of this sample might have possibly affected the spectroscopic result somewhat, two or three fresh trials were made on concentrated solutions before full evaporation, but with no different result.

Pb was tested for in a large test tube (8 inch) full of the sample (after acidulation with 1-2 drops acetic acid) by addition of a drop of solution of $K_2 Cr_2 O_7$, with no result. Cu was tested for in a similar manner with 1-2 drops solution $K_4 Fe Cy_6$ and allowed to stand over night, when a very faint greenish or greenish-blue tint was apparent,—evidently due to Fe only. Mn was tested for by $Pb O_2$ and $H N O_3$, with no result (in concentrated solution.) Acids. Fair tests for H Cl and $H_2 S O_4$ were obtained. Cl water and $C S_2$ showed scarcely definable traces of Br; and $(N H_4)_2 M O_4$ in $H N O_3$ solution gave no distinguishable trace of $H_3 P O_4$; and no I or $Ti O_2$ were found,—all worked for from concentrated solutions of course. Most, if not all, nitrates and nitrites would have been destroyed by ignition in presence of organic matter, and were therefore not looked for at this point; see under Quantitative work. In reference to the comparatively few elements found, it is to be remembered that different results might have been reasonably expected could large quantities of the water have been spared for such work.

QUANTITATIVE WORK.

In each case three litres were taken and evaporated to dryness, after acidulation with H Cl, and $Si O_2$ separated in the usual way, with care against high heating and consequent danger of

partial reunion of separated $Si O_2$ with the bases. $Fe_2 O_3$ and $Al_2 O_3$ were precipitated from the filtrate by boiling with fair excess of $N H_4 O H$ (in presence of $N H_4 Cl$) and the united oxides weighed. The Fe was subsequently subtracted, after volumetric estimation by Oudeman's method (i. e. by $\frac{n}{10}$ $Na_2 S_2 O_3$ in presence of $Cu S O_4$ with a drop of K Cy S as indicator) and also by the excellent method described in Prof. Cheever's Laboratory Notes (Part I., p. 27 and Part II., p. 6), by reducing $Fe_2 Cl_6$ to $Fe Cl_2$ in boiling H Cl solution by means of $Sn Cl_2$ carefully added from burette, and any excess of $Sn Cl_2$ taken up with $Hg Cl_2$, and the $Fe Cl_2$ titrated with $\frac{n}{10}$ $K_2 Cr_2 O_7$. Al and Fe were also directly separated by pouring into boiling K O H in excess, after the method of Fresenius.

Ca and Sr were precipitated together from the filtrate from Fe and Al by addition of $(N H_4)_2 C_2 O_4$ and $(N H_4)_2 C O_3$, the combined precipitates carefully heated in platinum crucible by playing back and forth underneath a small flame and carefully noting the change in color of the precipitates. After thus working to constant weight the residue was tested with a bit of moistened turmeric paper to see that no reduction to oxides had occurred.

The Ca and Sr were then separated by the method of H. Rose (given by Fresenius) by precipitating with $(N H_4)_2 S O_4$, filtering hot, and continued washing with concentrated solution of $(N H_4)_2 S O_4$ until filtrate shows no test with $(N H_4)_2 C_2 O_4$. This filtrate after concentration, re-worked for Ca by re-precipitation with $(N H_4)_2 C_2 O_4$. The Sr was treated similar to $Ba S O_4$ and weighed as $Sr S O_4$. After weighing Ca as $Ca C O_3$, in addition to precautions mentioned above, the precipitate was in each case dissolved in excess of boiling $\frac{n}{10}$ $H_2 S O_4$—to expel $C O_2$—and the excess of $H_2 S O_4$ neutralized by $\frac{n}{1}$ K O H, with phenolphthalein indicator, and Ca re-calculated, as a check.

Mg was precipitated from the filtrate from Ca and Sr in the usual way as $N H_4 Mg P O_4$ and weighed as $Mg_2 P_2 O_7$. Double precipitation of the Ca and Sr was performed in each case to ensure separation of Mg.

Na. 1 litre was taken in each case, and the Na separated and weighed as Na Cl, and then dissolved in water, and the Cl estimated with standard solution $AgNo_3$ and Na recalculated. The method for *separation* followed is the one used for separation of K, recommended by the Association of Official Agricultural Chemists, 1886, (Dep't Agculture. Div. Chem.; Bulletin No. 12). The principle is familiar, *i. e.*, the removal of bases and H_2SO_4 by boiling with $Ba(OH)_2$ and a little $BaCl_2$, filtering, and removing Ca from the filtrate by $(NH_4)_2C_2O_4$, and the excess of $BaCl_2$ by $(NH_4)_2CO_3$. The evaporated residue ignited, dissolved, filtered, acidulated with a drop of HCl ignited, and weighed, as Na Cl. and treated as above. Great care and practice seem essential to obtain anything like closely concordant results. In the following table, because of considerable divergence in the gravimetric results, only the volumetric results are considered—the average of all being taken. That appreciable quantities of Na Cl may be lost by several minutes' ignition at red heat is shown by Fresenius' experiments.

H_2SO_4. The precipitate in the preceding results for Na (thrown down by $Ba(OH)_2$ and $BaCl_2$) was treated with HCl in excess in hot solution, thoroughly washed and treated as usual for $BaSO_4$.

HCl. $\frac{1}{2} - \frac{1}{4}$ litre concentrated to about 100 cc. and the Cl. estimated by $AgNO_3$, with K_2CrO_4 indicator. Two strengths Sol. $AgNO_3$ were tried; No. 1, 1 cc. = 1 mg. Cl.; and No. 2, 1 cc. = 0.1 mg. Cl.

Combined CO_2. 250 cc. was concentrated to about 100 cc. and moderate excess of $\frac{N}{10}$ H_4SO_4 run in from burette and the solution was boiled to free it from CO_2. Then excess of acid was neutralized with $\frac{N}{10}$ KOH with phenolphthalein as indicator. Fresenius recommends HNO_3 with tinct. cochineal indicator; but probably through inexperience in its use its results were not thought to be so satisfactory as the method mentioned above. I am aware the method adopted is open to very serious objections, not the least of which is the danger of loss of HCl and HNO_3 on boiling to expel CO_2. It was attempted to avoid this (and the consequent high results) as

much as possible by working to get the approximate point with the standard alkali with turmeric indicator *before* boiling, and then finishing in the usual way. It will be observed that if *all* the H Cl and HNO_3 were lost, it would increase reading for combined CO_2 about 1.7 mg. per litre. It would, on the whole perhaps, have been better to have used the theoretically *much* better method of liberating the CO_2 by acidulation in closed flask and absorbing the CO_2 in K O H bulbs—or standard $Ba(OH)_2$ solution by Pettenkofer's method. This was not tried, however, from fear of loss in transferring from evaporating dish to flask.

Nitrites. Test was made for nitrites, with no result, by Griess' very delicate method, *i. e.*, with sulphanilic acid and napthalamine hydrochloride.

Nitrates. * 100—300 cc. of the water were evaporated to dryness, 3—5 drops phenolsulphonic acid, then 2 cc. distilled water and slight excess NH_4OH added, and the whole diluted with distilled water to compare with a standard color solution made up in the same way, from KNO_3 of such strength that 1 cc. = .005 mg. N_2O_5. The excess of H_2SO_4 in the phenolsulphonic acid liberates HNO_3 from nitrates, and ultimately ammonium picrate is produced, causing intense yellow solution. The reactions are as follows:

$$\underset{\text{Phenol}}{C_6H_5OH} + H_2SO_4 = \underset{\text{Phenolsulphonic Acid.}}{C_6H_4(OH)SO_3H} + H_2O.$$

$$\underset{\substack{\text{Phenol-}\\\text{sulphonic Acid.}}}{C_6H_4(OH)SO_3H} + 3HNO_3 = \underset{\text{Trinitrophenol.}}{C_6H_2(OH)(NO_2)_3} + H_2SO_4.$$

$$C_6H_2(OH(NO_2)_3 + NH_4OH = \underset{\substack{\text{Ammonium}\\\text{picrate.}}}{C_6H_2(ONH_4)(NO_2)_3} + H_2O.$$

The color readings were made in the graduated carbon tubes, (in use in the laboratory for colorimetric estimation of carbon in steel). Owing to the presence of organic matter in the water, the test was not applied directly to the evaporated residue; but the concentrated liquid was first filtered and then evaporated to dryness—otherwise a modified tint occurred,

* Method of Grandval and Lajoux; 1885, Compt. Rendus 101, 62. Abstract by A. Percey Smith; 1885, *The Analyst*, X., 199.

interfering with the color. There are some objections to the method (owing largely to lack of full knowledge as yet as to possible interfering agents, which might cause similar or masking colors, the possible influence of nitrites, etc.), and in future work of this sort parallel tests will be made with the zinc-copper couple, by the Blunt-Williams method, with precautions mentioned in Professor Prescott's recent article in *The Pharmaceutical Era*, I: 99, (Apr., 1887.)

HARDNESS.

Temporary and permanent hardness were estimated in the usual way by reagents of the standard strengths used in this laboratory, *i. e.*, $Ca\,Cl_2$ solution, 1cc. = 1 mg. $Ca\,C\,O_3$; soap solution, 13 cc. = 12 cc. of the $Ca\,Cl_2$ solution, when the latter is made up to 70 cc. with distilled water, thus allowing for 1 cc. soap solution destroyed by 70 cc. water; 1 cc. soap = 1°, or 1 grain $Ca\,C\,O_3$ to the English gallon, or in the following table changed to parts per million.

ORGANIC MATTER.

Free and Albuminoid Ammonia.

Estimated by the usual Wanklyn method. Four distillates of 50 cc. each were taken for free ammonia; then 50 cc. of alkali, $K\,Mn\,O_4$ solution were run in, distillation rapidly carried on to as near dryness as was deemed safe. 500 cc. was amount of sample taken each time. Some astonishment was felt at the seemingly high result; but as the duplicates agreed very closely, the results are confidently submitted for what they may be worth, considering the length of time the water stood before analysis. Mallet's report, before mentioned, contains some interesting figures on the changes occurring in organic matter on thus standing. The standard solutions for this process were carefully prepared, with specially prolonged boiling of the alkali $K\,Mn\,O_4$ solution.

"*Oxygen Consumed.*" * 200 cc. of the sample was acidulated with 10 cc. diluted $H_2\,S\,O_4$ (1: 3) and sufficient $K\,Mn\,O_4$

* Kubel und Tiemann, 1874; Anleitung zur untersuchung von Wasser, 2te Auf. 99 und 100): Abstract in Mallet's report on Water Analysis; National Board of Health Report, 1882, p. 283.

solution run in to retain decided tint after ten minutes' boiling. The lamp is then removed and sufficient solution oxalic acid added to destroy the color, and then the faint pink is just restored by careful addition of $KMnO_4$. The $KMnO_4$ is $\frac{N}{80}$ strength, furnishing 0.1 mg. available oxygen per cc.; and the oxalic acid made to correspond volume for volume. This test is claimed by its authors to be of value in sanitary examinations, indicating something of the nature of the water by the amount of *readily oxidizable* organic matter it contains: nitrites, ferrous salts, etc., even chlorides in great excess, also reduce the $KMnO_4$ however, and have to be allowed for, if present. The "Actinic," or other recently proposed methods, such as depend on reduction of Ag. or Au salts by organic matter (especially as claimed by *nitrogenous* organic matter) were not tried.

The Specific Gravity of the water was taken by the spherical sp. gr. bottle in case in this laboratory, and both distilled water and the sample were brought to 27° C before filling the bottle.

General Physical Appearance of the Water.—Although the general appearance of the water is very bright and clear, some minute, shining scale-like particles, are occasionally seen in suspension. Also, at the bottom of the water were collected some small masses of light brownish organic matter, which were thought to be algae; but they were so disintegrated that they presented no clearly defined shape or appearance under the microscope.

The residue, left on evaporation for total solids, had something of a shining, scale-like appearance, and light grayish-brown color; and on ignition indicated, by faint darkening rings, the small amount of organic matter present, but gave off no particular odor.

The taste is scarcely different from that of a good distilled water, indicating its great purity and small amount of soluble salts. Even the concentrated solution from evaporation had no definable taste.

In the following table all results are the *average* of results obtained; and in no case the result of a single estimation.

*All results given in parts per million,** or, what is the same thing, milligrammes per litre.

Specific Gravity, (at 27° C) — 1.0004
Total Residue, ... — 69.97
Inorganic Residue, ... — 57.61
Loss on Ignition... ..... — 12.36

Organic Determinations:

Free Ammonia..... — .061
Albuminoid Ammonia.. — .12
Oxygen Consumed..... — 1.77

Hardness:

Temporary..... — 48.57
Permanent ..... — 38.28

Inorganic Constituents:

Al_2O_3	— .90.....	∴	Al	— .48
Fe_2O_3	— .99.....		Fe	— .69
Ca O	— 17.98.....		Ca	—12.80
Sr O	— 1.60.....		Sr	— 1.34
Mg O	— 4.63.....		Mg	— 2.78
Na_2O	— 4.29.....		Na	— 3.18
K_2O	— very faint trace.....		SO_4	— 3.73
SO_3	— 3.11.....		SiO_2	— 8.53
SiO_2	— 6.73.....		Cl	— 2.43
Cl	— 2.43.....		N_2O_5	— .77
Br	— trace...		CO_2	—22.23
			Total.....	—58.96
N_2O_4	— 0.00			
N_2O_5	— .67			
CO_2	— 16.30			

* In grains, per wine gallon.

Total Residue	4.081
Inorganic Residue.....	3.360
Loss on Ignition	0.721

INORGANIC CONSTITUENTS.

Al_2O_3	0.0525
Fr_2O_3	0.0577
Ca O	1.0488
Sr O	0.0933
Mg O	0.2701
Na_2O	0.2505
SO_3	0.1814
$Si O_2$	0.3926
Cl	0.1417
N_2O_5	0.0891
CO_2	0.9508

The purpose of this second set of figures, with bases reported as free elements and the acids as acid radicals, is that the total of results thus obtained may be compared with the inorganic residue. The two results should approximately agree, although perfect coincidence cannot be expected, since SiO_2 is apt to exist in part (at least) free, and to displace some of the CO_2 in the carbonates of the residue, basic salts are apt to occur on heating the residue.

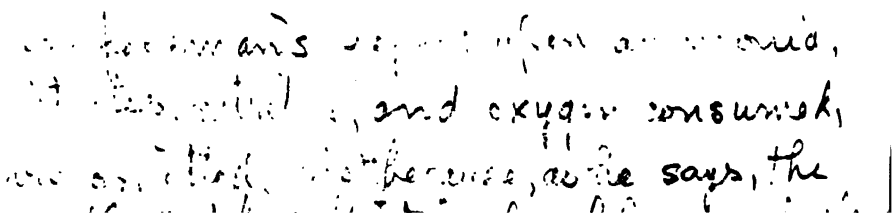
Below is given a comparison with ingredients of Lake Michigan water, so far as the same constituents in each have been determined.

(From Prof. Mallet's Report for the Lake Michigan water.) See *ante*. All expressed in parts per million.

	Total Solids.	Loss on Ignition	Chlorine.	Free NH_3	Alb NH_3	Nitrites	Nitrates.	Oxygen consumed by Kubel's Process.
Lake Michigan Water.	160.00*	60.00	2.00	.095	.09	None.	Trace.	1.5
Lake Superior Water.	69.97	12.36	2.48	.061	.12	None.	.67	1.77

This higher reading for "oxygen consumed" in case of the Lake Superior water (while there is much *less* organic matter present) may be in part due to a greater degree of decomposition of organic matter (or a more readily oxidizable kind of organic matter); and in part due to the fact that no deduction was made in this case by parallel check determinations on an equal amount of distilled water, a practice which is sometimes followed, but which I was unable to determine whether followed or not in the case of the Lake Michigan sample, as no mention *in loco* seems to be made of it. Of course the *kind* of organic matter has much to do with the effect on $KMnO_4$ solution, and in no ordinary case is it claimed that absolutely all organic matter would be oxidized by the $KMnO_4$ solution, even were it in alkaline, instead of acid, solution.

* Total solids in Lake Michigan water, 9.333 grains in a wine gallon; loss on ignition, 3.500; residue, 5.833 grains.



Query No. 46.

A Chemical Analysis of Lappa is Desired.

By Florence Edith Hendershott, Ph. C.

The analysis made was of the root, and the method followed was that given in "Parson's Plant Analysis."

The sample was reduced to a number sixty powder. A portion of this was dried at 110° C. and the loss in weight showed the amount of moisture to be 10.57 per cent.

This powder was incinerated in a porcelain crucible until the carbonaceous material was completely destroyed. The residue was weighed to determine the per cent. of inorganic substances, which was 5.25 per cent. Of this 37.54 per cent. was soluble in water; 32.30 per cent. in hydrochloric acid; 28.11 per cent. in sodium hydrate; and 2.15 was sand and clay which adhered to the drug and remained insoluble. The water solution contained the chloride, carbonate, phosphate and sulphate of potassium, the hydrochloric solution, the oxides of iron and the phosphate of calcium; while that part which dissolved in sodium hydrate, consisted of the silicates of the ash.

Another portion of the drug was extracted with chloroform by repercolation. The extract, which was of a light yellow color and neutral reaction, was evaporated to dryness on the water bath and weighed. The residue, which was 4.27 per cent. of the drug, was then dried at 110° C. and the loss in weight was found to be 35.64 per cent. The residue had the characteristic odor of the drug and contained glucosides, a soft resin, and a small quantity of fixed oil.

The part of the drug left after extracting with chloroform was dried at 110°, weighed and extracted with alcohol in the same manner in which the chloroform extract was made. This extract was of a brownish color and when evaporated to dryness

the residue equaled 11.95 per cent. of the drug left after extracting with chloroform. This residue was completely soluble in water and was identified as an extractive and a glucoside.

The residue left after extracting with alcohol was dried as in the previous operation and treated with a known quantity of cold water. This solution was of a dark brown color, had a slightly acid reaction and contained 52.32 per cent. of solids. This solid portion consisted of calcium arabinate, pectic acid, arabin, and extractive. The solution frothed upon agitating and saponin was suspected but upon applying the test no saponin was found and the conclusion was that the frothy appearance was due to the arabin present.

The dried residue left after the water solution was treated with an acid solution containing 5 per cent. by volume of sulphuric acid and heated to convert the starch into sugar. The amount extracted by this acid solution was 1.5 per cent.

The drug, after being thoroughly washed and dried, was treated with a 2 per cent. solution of caustic soda which removed 8.13 per cent. of pectic acid and coloring matter.

The residue left after the previous treatment was washed, dried, and weighed. This residue, which was 2.3 per cent., consisted of lignin and coloring matter.

The following table gives the per cent. of solids removed by the different menstruums:

	Per Cent.
Chloroform extract	4.27
Alcoholic extract	11.95
Water solution	52.32
Acid solution	1.50
Alkaline	8.13

Query No. 37.

What Disinfectant and Antiseptic Preparations can the Dispensing Pharmacist Make with Advantage?

By A. S. Mitchell, Ph. C.

In the answering of this query another arises which is of prime importance, viz.: What substances are of true value as disinfectants or antiseptics? This has been the subject of an elaborate series of experiments by the Committee on Disinfectants of the American Public Health Association, Dr. Geo. N. Sternberg, chairman. A report of the results of their investigations was published in pamphlet form in 1885. In the "conclusions" (page 123) the substances found active are summed up as far as may be according to their relative values.

As these investigations have been so conclusive, I feel justified in limiting myself to the consideration of only those substances which are here recommended, and these only in strengths which have been demonstrated as active.

Three standard solutions are here recommended (page 131), and directions are given for the use of each:

"Standard Solution No. 1."

"Dissolve chloride of lime, of the best quality, in pure water in the proportion of four ounces to the gallon."

If the chlorinated lime used contained 25 per cent. of available chlorine, as recommended by the U. S. P., and four avoirdupois ounces were taken, this solution would contain but .75 per cent. of available chlorine.

As this solution is so weak, it is to be recommended to prepare it of twice the strength, or using eight ounces of chlorinated lime to the gallon, as advised in a foot note at the bottom of page 131. In the preparation of this solution it is well to triturate the chlorinated lime briefly with successive portions of

the water, finally diluting the decanted portions to the required volume. For dispensing, the clear solution left on standing may be decanted and will present a more pleasing preparation than the turbid mixture.

Filtration is not desirable, as the exposed surface allows of the escape of a considerable amount of chlorine.

I have examined a few samples of chlorinated lime as found upon the market, with the following results :

		Per Cent.
No. 1.	Available Chlorine	31.12
No. 2.	" "	39.26
No. 3.	" "	31.65
No. 4. (*a*)	" "	25.1
No. 4. (*b*)	" "	23.6

The packages as procured were all put up in paste-board boxes and sealed with resin. The samples were taken from the center of the packages in all cases. In No. 4, two analyses were made; the second (*b*) was made upon the layer lying next the cover, and showed a loss of 1.5 per cent. over that taken from the center. No. 3 was of the same make as No 2, but the package was slightly torn, allowing some escape of chlorine. The available chlorine was estimated volumetrically by the addition of an excess of a standardized solution of As_2O_3 and titrated back by a standardized solution of iodine, both being freshly prepared and checked. Titrations were made in duplicate and where variations occurred were repeated until verified. These explanations apply also to estimations of chlorine in solutions of chlorinated soda, to which I shall refer.

These results show that the chlorinated lime upon the market, when properly put up, can be relied upon to furnish the required amount of chlorine. The reason for the high standard of chlorinated lime is stated by Dr. Squibb (Ephemeris, Vol. II, 807). The British standard is placed at 32 per cent. and the importation of the European article keeps the standard high.

The committee state in a foot-note (page 131) that chloride of lime can be bought at $3\frac{1}{2}$ cents per pound. Dr. Squibb gives an interesting calculation, showing that with cost of package,

freight and profits, it should cost the consumer 30 cents for a two-pound package. I find one pound packages for sale in stores at 15 cents or just his estimate (Ephemeris, Vol. II, 808).

"STANDARD SOLUTION No. 2."

"Dissolve corrosive sublimate and permanganate of potash in pure water, in the proportion of two drachms of each salt to the gallon."

This gives a solution of mercuric chloride in the proportion of 1 to 486 or about 1 to 500. The permanganate though an oxidizing reagent is added more as a guard against accidents.

Mercuric chloride is the most active of all disinfectants and the chief objection to its use is the danger with which it is attended. But when the fact is taken into consideration that of all the proprietary disinfectants on the market, which were examined and tested, the only ones with one exception that did not fail in less than forty per cent. contained this dangerous salt (Report, pages 15–16), it seems far more to the safety of the public that solutions of this salt should be dispensed, colored and under proper warning labels.

For the reason of its great disinfecting power this forms a solution of much merit. It is attractive in appearance and keeps well.

"STANDARD SOLUTION No. 3."

"Dissolve four ounces of corrosive sublimate and one pound of sulphate of copper in one gallon of water. Two fluid ounces of this solution to the gallon of water will make a solution suitable for the disinfection of clothing."

The great strength of this solution hardly recommends it as one to be trusted in the hands of the public.

The sulphate of copper used, however, forms solutions quite pleasing to the eye, and in cases where the permanganate stains are objectionable this might be substituted in Standard Solution No. 2. A solution of chlorinated soda is recommended and advised to contain at least 3 per cent. of available chlorine. This can be made by increasing the quantities of chlorinated lime and carbonate of sodium in the U. S. P. liquor sodæ chloratæ by one half.

These solutions deteriorate very rapidly and those which I took occasion to examine were far below the U. S. P. requirements. In four samples procured from the stock bottles of dispensing druggists I found:

		Per Cent.
No. 1.	Available Chlorine	.354
No. 2.	" "	.148
No. 3.	" "	.148
No. 4.	" "	.137

I prepared two samples from the same sample of chlorinated lime. The first was precipitated in an open beaker and strained. The second was precipitated in a closed salt mouthed bottle and the solution decanted. The second was found to contain over twice the amount of chlorine found in the exposed one. If this liquor is used in the place of Standard Solution No. 1 it should be prepared extemporaneously and without access of air as far as possible.

Carbolic acid is to be recommended. The solution to be dispensed is placed at 5 per cent. I purchased a sample of white crystallized carbolic acid, apparently pure. This on standing in 5 per cent. aqueous solution for three weeks, threw down a brown precipitate giving the reactions for resins, probably empyreumatic oxidation products from the substances not separated in the manufacture.

This oxidation is lessened by concentration. It is therefore well to keep in stock a stronger solution to be diluted as called for. A 50 per cent. solution could be kept and easily diluted to any desired strength, one part of the solution to nine of water, giving the strength recommended by the committee.

A solution of commercial sulphate of copper is easily made and exceedingly cheap. A 5 per cent. solution can be prepared by dissolving in water with or without heat and straining through muslin, the slight precipitate forming on standing being of little detriment to the attractiveness of the solution. Chloride of zinc is advised in a 10 per cent. solution. The principal objection to its use is the cost of the fused chloride, now quoted at ninety cents per pound. I have been able to procure an impure article

answering its purpose at 70 cents per pound. The U. S. P. liquor zinci chloridi can be diluted with four times its weight of water for this solution, or an impure liquor containing some iron can be made by the U. S. P. process, omitting the addition of zinc carbonate.

The burning of sulphur may be conveniently done by using a mixture of two pounds of broken roll sulphur and one pound of sulphur flowers, to be saturated with alcohol before lighting. This quantity is sufficient for 1,000 cubic feet of air, and will not melt down and check the burning as sulphur flowers alone are apt to do.

In conclusion, it seems advisable to prepare three stock standard solutions as recommended, No. 1 depending upon the available chlorine; No. 2 depending upon mercuric chloride, and No. 3 depending upon mercuric chloride but suitable for the disinfection of clothing, etc.

There should be printed labels giving directions for their use as directed by the committee in their report (pages 131-133). These are sufficient to fill most demands.

The solution No. 1 should not be made in quantities which would necessitate being kept long in stock.

In addition three pound packages of mixed sulphur can be kept in stock, as may also a 50 per cent. solution of carbolic acid, not necessarily pure. Solutions of sulphate of copper, chloride of zinc or of chlorinated soda may be prepared extemporaneously in strengths stated above.

DISCUSSION.

Dr. LYONS—This subject is one of considerable practical interest. Druggists everywhere are called upon for disinfectants; every druggist ought to be in possession of the paper spoken of, issued by the American Public Health Association. It contains details with regard to the preparation and uses of the different disinfectants recommended so that the druggist can supply them. If he will take the trouble to have labels printed, together with full directions for use, he can confidently recommend these disinfectants to his customers, and will find them a source

of profit to himself and much better than any of the ordinary disinfectants offered for sale. One or two points with regard to some of the special disinfectants mentioned in the paper: The use of permanganate of potassium in combination with corrosive sublimate I think is objectionable on account of the stains it produces. If it is used we must caution those who employ it in regard to this objection, but I cannot see myself why there should not be substituted for it some other coloring agent, *e. g.* an aniline color, which would answer as well. The quantity prescribed is too small to be of any practical use for its disinfectant effect. In regard to the zinc preparation I would say there is no necessity for paying 70 cents per pound for chloride of zinc, as there is no druggist who cannot dissolve the metal or the oxide in hydrochloric acid. The product will cost him only a few cents a pound. If he follows the formula of the pharmacopœia for liquor zinci chloridi he will have no difficulty in adjusting very nearly the strength of the preparation.

Mr. WELLS—Was this report made up from Prof. Sternberg's report, or was it from experiments made at the School of Pharmacy?

Prof. PRESCOTT—From both. Investigations were made as to the quality of the materials upon the market, and the writer proceeded according to Dr. Sternberg's report. The details of that report are subject to some discussion. Sternberg's paper is taken in the opening of the paper as a text.

Mr. DEAN—Are we to understand from that paper that permanganate of potassium has no disinfecting qualities? I had supposed it had disinfecting and antiseptic qualities.

Prof. PRESCOTT—Certainly it has, but as already remarked by Dr. Lyons, its chief use in the combination spoken of is as a coloring agent. It is a very powerful oxidizing agent, and oxidizing agents are disinfectants in almost every instance, the most powerful agent we have. The objection taken is that while the quantity used is too small to be of any practical use, it is peculiarly unsuitable for a coloring agent, because it is so unstable and because it stains white fabrics.

Mr. Dean—I know by experience that the permanganate is a powerful deodorizer. A gentleman who was having a sewer constructed found it necessary to excavate through an old sewer which had been left for a long time, and the smell was terrible, so much so that the workmen became sick while excavating it. He came in and wanted a disinfectant and I gave him two ounces of permanganate of potassium to be used in a bucket of water, and within two hours they went on with their excavating without any trouble.

Prof. Prescott—There is no question about the value of the permanganate, used in sufficient quantities. In this mixture, however, its use avowedly is merely to give the poisonous solution a color as a safe-guard against accidents.

Dr. Lyons—There is one other point I wished to touch upon, that is the burning of sulphur. Those who have had any practical experience know that although sulphur burns easily there is often a great deal of trouble in making it burn continuously in a close room. The expedient is a very good one of using flowers of sulphur instead of brimstone and pouring over it a little alcohol. Another expedient of which I have never seen mention made, and which I discovered by chance, is simply to mix the sulphur with about half its weight of any inert powder—terra-alba, powdered clay or any other cheap earthy material—this acting as a sort of wick. A mixture of this kind will burn with great certainty, while the pure sulphur will go out.

Mr. Bassett—Probably our late health officer in Detroit, Dr. Wight, was as good authority on disinfectants as any man we had in the State. For several years I have had the preparation of the disinfectants used by our city, and I have obtained considerable practical knowledge in that way. This matter of burning sulphur is quite easily arranged, and I think that Dr. Wight's method is a much better way than sprinkling the sulphur and brimstone with alcohol, which is quite expensive. Dr. Wight used a mixture composed of sulphur, saltpeter and camphor, in the proportions of about 80 per cent. of the flowers sulphur, 15 per cent. of nitre, and 5 per cent of gum camphor.

This mixture has been used in our city for the last four or five years for the purpose of disinfecting where we have had diphtheria, smallpox and diseases of that nature; it burns freely and I think is the best way of using sulphur as a disinfectant.

Mr. WELLS—I think it is pretty well understood by those who have investigated the subject of disinfectants that the most efficient germicide we have is mercuric chloride. Of course it is a dangerous poison, but for a great many purposes that is not an objection, and I think it should be generally known that it is the best of all true disinfectants. Of course for fumigating rooms nothing equals sulphur, but for disinfecting cesspools, sewers and other similar purposes mercuric chloride can be used, and it is the most valuable article known for the purpose.

Prof. PRESCOTT—With reference to the economy of dispensing with alcohol and the proposed substitution of saltpetre I think I could approve of the proposition that Mr. Bassett recommends but I cannot see what is gained by introducing camphor. Would not the camphor introduced cost more than the alcohol left out?

Mr. BASSETT—I should think not.

Prof. PRESCOTT—Five per cent. of camphor? That would be a question; it would come pretty near it. I would inquire if there is any good reason for introducing the camphor? Of course the agreeable odor of the camphor would be lost where it is used in combination with sulphur.

Mr. BASSETT—The camphor possibly would not add to the disinfecting qualities of the mixture, although it was originally introduced into the mixture probably with that view, but it adds very materially to the facility with which the mixture burns. The combination certainly does burn very evenly and nicely.

Dr. LYONS—There is one more practical point with regard to the use of corrosive sublimate: It is not only poisonous but it corrodes metals where it is used as a disinfectant about water closets. That point should be remembered.

Query No. 27.

In Kerner's volumetric estimation of other alkaloids with Quinine Sulphate, what effect has the temperature during titration?

E. A. Ruddiman, Ph. C., M. Ph.

In connection with the answer to this query, other work was done with Kerner's test of quinine sulphate. And in publishing this other work to make it complete it seemed necessary to publish the answer to this query also. The article in full is found in the June and July numbers of the Pharmaceutical Era. A very brief resume of it is here given.

Kerner's test is based upon the following principles First, the solubility of cinchonidine sulphate in water, and 2nd, the insolubility of cinchonidine sulphate in ammonia water. It has been a long recognized fact that the temperature of filtration, after digestion of the quinine sulphate in water, has much to do with the amount of ammonia necessary to dissolve the precipitate formed. But the effect of the temperature during titration seems to have been overlooked. To determine this effect I prepared a standard saturated solution of chemically pure quinine sulphate and also a standard solution of ammonia water, sp. gr. 0.920. 10 cc. of the standard quinine sulphate solution were titrated with the ammonia and the temperature of the resulting liquid taken as soon as the titration was completed. For each degree between 14° and 26° inclusive there were about ten titrations made. Taking the average titration for each degree I found the difference between it and the next higher. Then taking the average of these differences I found the general average difference to be 0.148 cc. for one degree. Or in other words, in the estimation of cinchonidine sulphate in quinine sulphate to obtain the correct amount of ammonia water, sp. gr. 0.920 at 15° C. which is required to dissolve the precipitate first

formed, there must be added to the amount of ammonia used for every degree of temperature above 15° C., 0.148 cc. Similar experiments were made using ammonia water of sp. gr. 0.960, and the general average of differences was found to be 0.172 cc.

In connection with this work, the following conclusions were arrived at.

(1) That the U. S. P. method of testing commercial quinine sulphate does not as a rule indicate correctly the amount of cinchonidine sulphate which is present. To obtain more nearly the correct amount the quinine sulphate should be entirely dissolved in hot water previous to applying the test to the filtrate.

(2) Kerner having given various figures for the amount of ammonia water which corresponds to one milligram of cinchonidine sulphate, some work was done on this point by the writer. As an average of twenty-five experiments covering one hundred titrations I found that when one milligram of cinchonidine sulphate is dissolved in 10 cc. of a saturated solution of quinine sulphate, 0.36 cc. more of ammonia water, sp. gr. 0.920 is required than when the standard solution is titrated alone, *i. .e*, in the testing of commercial quinine sulphate, every 0.36 cc. of ammonia water used in titrating the 10 cc. of filtrate from the sample being tested, over that used in titrating the 10 cc. of filtrate from the standard quinine, indicates one milligram of cinchonidine sulphate in one gram of the sulphate of quinine tested, or 0.1 per cent.

(3) It having been a fact recognized by many within the last few months that in the quantitative estimation of cinchonidine sulphate in commercial quinine sulphate all of the cinchonidine is not dissolved by digesting the quinine salt in 10 parts of water at 15° C., a modification of Kerner's method is proposed. It consists in dissolving the salt under examination in 30 parts of boiling water previous to applying the ammonia test.

(4) Attention has been called to the fact that in the U. S. P. test for forms of quinine, other than the sulphate, there is a deviation from the amount of water in proportion to the sulphate used from that directed in Kerner's original test. Equations are

given showing the amount of water which should be used if this latter proportion be preserved. For one gram of the alkaloid there should be used 11.7 cc. of water; for the sulphate 10.14 cc.; for the hydrobromide 10.2 cc.; for the hydrochloride 10.895 cc., and for the bisulphate 8.07 cc.

In applying the U. S. P. test to the forms of quinine, other than the sulphate, some have found difficulty in obtaining the required 5 cc. filtrate. C. N. Lake proposes to obviate the difficulty by increasing both the amount of the salt and of water, yet preserving the proportion between them. I found no difficulty by taking for the alkaloid twice the proportion given in the U. S. P., for the hydrochloride and hydrobromide the same as there given and for the bisulphate twice the proportion.

Query No. 30.

What are the causes of variation in color of Tincture of Opium?

JULIUS O. SCHLOTTERBECK, PH. C.

At first thought, one would probably think: "Of what importance would an answer to the above question be?" I did not myself see, unless tincture of opium was sometimes so variable in color as to cause suspicion that it was fraudulently manufactured, or some artificial color was being added to make it represent something better than it really was.

Very little, if anything, has been written upon this subject, as one would naturally suppose, as the quality or strength cannot be judged by its color. As every pharmacist knows, some laudanum is lighter and some darker. There are several reasons for this, and I have placed them in three classes, and of these three classes I will speak separately. The first class will contain the most common reason, that is the different ways in which actual shortage of opium will cause a difference in color in the tincture. The second class will include the conditions of opium that will influence the color of the tincture. The third

class will include the adulterations that will more or less affect the color of the tincture, with tests for the detection of the more common ones.

Upon asking ten druggists the reason why some laudanum was darker than other, seven of them thought it an easy question, and said, "they don't put enough of the substance in that colors." As they all had good experience, they were undoubtedly right to a great extent. As a rule, the majority of customers believe the darkest tincture to be the best, but, on the contrary, natural light opium will, in the majority of cases, yield the greatest amount of morphine, as has been shown by hundreds of analyses.

There are a great many ways to account for shortage. The one mistake most easily made, and most excusable, is the making of tincture by the formula of U. S. P. 1870, instead of U. S. P. 1880. The difference in strength of morphine, or rather opium, in these two Pharmacopœias is not so great as to cause a great variation in color of tincture. But as one is a little inclined to take short weight of so expensive a drug, a difference would be noticed. Again, some take of moist opium the same amount required of dry opium; then dry, pulverize coarsely, and macerate and percolate. Others make the tincture by titrating the moist gum with the proper menstruum until a thick, homogeneous liquid is obtained, and then percolating with more menstruum. H. M. Wilder is authority for the statement that five-sixths of the drug stores in the United States keep two strengths of laudanum, one for the prescription counter and one for the sales counter. To avert suspicion, something must be added to bring up the color. Most German stores, he says, have two formularies or pharmacopœias. The officinal for prescriptions and the "Manual" for the sales counter. In Hager's Manual (Praxis) Commentary, and Mohr's Tecknik, etc., you will find formulas with the officinal name, but modified for the sales counter. Here is an opportunity for adulteration by adding a color. While the substance used may be perfectly harmless, the intent is deception. I saw laudanum made in the following manner: The correct amount of opium for one gallon of tincture was taken, and the process carried out according to the

pharmacopœia, but on account of incomplete exhaustion, the last portion of the percolate came through quite colored. The operator probably thought it wasteful, and so added menstruum until the percolate was quite colorless, using about fourteen ounces of menstruum. If a light opium had been employed, the tiincture would have been quite light.

Second Class. In *Pharmaceutical Journal and Transactions*, vol. 11, page 805, Karl von Scherzer says: Plants grown from the white and yellow seeds, and producing white and yellow flowers, are preferred as they produce a large, vigorous head. yield an abundance of juice and clear gum, while plants grown from the gray or black seeds, yielding blue and dark red flowers, grow a small head, yield less juice, much darker opium and less morphine. Pereira states that if the dew has been heavy during the night, the yield of opium is greater, but it is much darker, while, if there has been no dew, the yield is less and the opium much lighter. Powdered opium generally makes a lighter tincture than gum opium, for the reason that manufacturers aim to select opium that is to be used for powder, that is light and entirely free from adulterations, as ext. licorice, gum, starch, sugar, etc. I am of the opinion there would be but very little difference in color between a tincture made from powder and gum of the same sample of opium. Mr. Guibort, *American Journal of Pharmacy*, vol. 34, page 397, says: opium becomes altered by age, becoming darker, yielding a darker tincture, and losing some of its alkaloid. In my store practice, in manufacturing tinc. opium, the gum was cut into thin slices and put into a cook or coal stove oven to dry. This generally required from two to three days. But very often it was carelessly left in the oven for four or five days, when part of it was somewhat charred. I noticed that the longer the opium was left in the oven after being once dry, the darker the tincture would be. The temperature was not known, but it was very much higher at some times of the day than others. Of the natural coloring matter of opium, Flückiger says but very little is known, but that it does contain an oxidation product that gives it its color, is known. If tr. opium be precipitated with a solution of lead acetate and the solution or mixture filtered, the

filtrate will be nearly colorless. If this solution be allowed to stand, it will again become dark-colored. This would seem to show that laudanum becomes darker upon standing.

Third Class. The most common adulterant to color is ext. licorice. This can be detected by separating the active principle, glycyrrhizin. Acids precipitate it from solution. The tincture can be precipitated, or the ammoniacal decoction of gum can be treated with an acid. The precipitate formed is easy soluble in ammonia, having a very sweet taste. Caramel is not so much used as licorice, and is much more difficult to detect. Red saunders is said to be used to a small extent in tincture manufactured by and for country stores. This can be detected by the color reaction with Fe SO and Hg Cl_2. Salep powder is used to accelerate the drying and hardening of opium. It can be detected by the slimy appearance of a decoction of opium. Dr. Squibb has found strained fig paste in some samples of opium. It is used to improve the appearance of opium. To cheapen opium, starch (wheat) is used abundantly.*

Opium adulterated with an extract of poppyheads can be detected by the odor and color, and the smoothness of the opium when rubbed on a porcelain slab. Poppy petals cause a sour and disagreeable odor. Tobacco leaves can be detected by the odor when slightly heated. Catechu causes a black precipitate with sesquichloride of iron, if added to a boiling decoction of the opium. All substances containing tannin can be detected this way, as natural opium contains no tannin. Flückiger says a criterion of good opium is the amount of ash it leaves when incinerated, 8 per cent. being the maximum limit. Also, that it should yield over 55 per cent. of aqueous extract (solid) when exhausted with cold water. Five samples were exhausted, dried and weighed, with the following results:

No. 1	56.342	per cent.
" 2	53.64	"
" 3	51.71	"
" 4	48.51	"
" 5	34.87	"

*British Year Book of Pharmacy, A. Christison, 1875, p. 192.

No. 1 was heavily adulterated with ext. licorice, which was easily detected by the method mentioned. No. 5 was very difficult to exhaust, as it had a tendency to gum up into small tough lumps.

The wide variation of morphine strength required by the Pharmacopœia is the cause, I think, of some weak laudanum being sold. In my opinion, an improvement could be made in this preparation. Many think the opium should be standardized to a certain morphine strength. This would not be wise, I think. Some substance would have to be used to bring it to a standard. It would, as Dr. Squibb says, open a path for lawful adulteration. But with the tincture a remedy can be found. This is to use assayed opium and calculate the amount required to contain 6 grs. of morphine to the fl. oz. But there are very few druggists that would take the time to do the calculating. A still better way would be to make the tincture from any specimen of opium, then assay the tincture and dilute to the required strength. If, by assay, not enough morphine be present to come up to the standard, then morphine could be added, or, better still, make a more concentrated tincture, so there will be more than enough to come up to the required strength. As shown by many different analyses of laudanum made, some are very much below the standard. A stringent law for drug adulterations could be very effectively carried out, as is shown by the prosecutions and convictions resulting from the investigations of Dr. B. F. Davenport, of Boston, Mass.

Volunteer Paper.

Opium Assay—Comparative results obtained by different methods.

By Chas. D. Wiley.

The object of this investigation is a comparison of the results of three different methods of opium assay made upon the same samples and under similar conditions. The methods used are those of Prof. F. A. Flückiger, Dr. E. R. Squibb, and J. Howard Wainwright. All of these methods precipitate the morphine by ammonia and obtain the alkaloid as a hydrate of the formula $C_{17} H_{19} NO_3 H_2 O$.

Flückiger, "by an analytical proceeding," as he expresses it, takes one-half of the watery extract. Reasoning, however, that as 60 per cent., by weight, of the opium is dissolved, in taking one half the watery extract, to the weight of one-half the water used, must be added 30 per cent. of the weight of the opium. To illustrate: when eight grams of opium and eighty grams of water are used, the weight of water collected should be equal to one half of eighty plus 30 per cent. of eight, making forty-two and four-tenths grams. He gives eight grams, as the weight of drug to be taken. This is treated with ether in a covered funnel, then dried and transferred to a flask containing water and allowed to macerate for twelve hours. Then the mixture is filtered and one-half the watery extract collected. Ether, alcohol and ammonium hydrate are added to this filtrate in a flask, the flask covered tightly, and the whole is then subjected to a vigorous shaking until crystallization begins.

After standing twenty four hours the ethereal layer is decanted onto a tared filter moistened with ether. More ether is added to the contents of the flask, shaken and allowed to separate, when the ethereal layer is again transferred to the filter. When the filter becomes dry, the contents of the flask are brought upon it and the crystals of morphine washed twice with a mixture of alcohol, ether and water. The crystals are then dried and their weight obtained, to which is added the weight of the crystals remaining attached to the sides of the flask.

Dr. Squibb, under the head of "Flückiger's method modified by E. R. Squibb," claims a superior process differing from

Flückiger's method mainly as follows: He omits the first step, the treating with ether. Instead of taking an aliquot part of the first filtrate he seeks to exhaust the drug by repeated shakings and percolations. He advises vigorous shaking previous to the twelve hours' maceration, claiming that it secures the alkaloid in smaller crystals, much more easily handled. He resorts to evaporation in order to reduce the bulky filtrate obtained by the repeated percolations.

Wainwright's method is very similar to Squibb's, the principal difference being that he uses hot water instead of cold to exhaust the opium.

Eighteen estimations were made. In each case, when two estimations by the same process on the same sample were made, the estimations were started at the same time, in the same sized flasks. and in fact carried through parallel to each other in every particular. The results were as follows:

SAMPLE POWDERED OPIUM.

Squibb's Process.....	13.80 per cent.	—	13.72 per cent.
Wainwright's Process.....	13.50 "	—	13.62 "
Flückiger's "	5.90 "	—	8.87 "
Flückiger's "	13.52 "	—	13.40 "

SAMPLE GUM OPIUM.

Squibb's Process.....	11.28 per cent.	—	11.14 per cent.
Wainwright's Process.....	10.80 "	—	10.75 "
Flückiger's "	10.65 "	—	10.49 "

The comparatively low results in the first two estimations by Flückiger's method was undoubtedly due to the fact that by mistake, twice the required amount of ammonium hydrate was used.

The fact of Squibb's method giving the largest per cent. of morphine led to the question regarding the possibility of presence of narcotine. A sample of powdered opium was subjected to this process, and also to Wainwright's process, giving the results 13.93 per cent. and 13.80 per cent. respectively. The lime water test applied to the alkaloid failed to give a satisfactory test in either case. And as to the relations of Squibb's test to Wainwright's, it might be noticed that during the evaporation in Wainwright's method. the gummy extract which forms around the edge of the evaporating dish, is not easily soluble and may retain some of the alkaloid.

Volunteer Paper.

Bibliography of the Opium Assay, and Dictionary of its Methods.

ABR. VAN ZWALUWENBERG.

This bibliography of opium assay is intended solely as an aid in reference, and for that reason only a short outline of each method is given, and all quantities are omitted. It is presumed that a person who adopts any method of assay for trial in an operation, will refer to the directions of the original paper, as found in some publication referred to in the bibliography. To facilitate a comparison and selection of methods, an abstract of each is given, followed by references to its several publications.

The dates of the different processes are merely approximate, as they could only be taken from the dates of the volume in which the reference was found. In many cases, the date of the reference could not be found. The methods have been arranged in alphabetical order of the authors' names, as being the most convenient for reference.

ALESSANDRI, Dr., P. E., 1881.—The opium is exhausted with a solution of oxalic acid. The solution divided into two portions is neutralized with caustic baryta. The precipitate from the first portion is treated with dilute alcohol, which, when evaporated, leaves the alkaloids. The precipitate from the second portion is treated with ether. This solution upon evaporation, leaves the narcotine.

Phar. Jour. Trans., 12, 994. Proc. Am. Phar., 1882, 231 Jahr. Technologie, 1883, 429.

ARNOLDI, C., 1873.—The opium is exhausted with water, and the insoluble residue dried and weighed. The filtered solution

is decolorized with animal charcoal, treated with ammonia, the excess driven off, and the resulting crystals of morphine dried and weighed.

Jour. Chem. Soc., 12, 1018. Chem. Centr., 1874, 54. Br. Yearbook, Phar., 1875, 285. Jahr. der. Chem., 1873, 961. Proc. Am. Phar., 1874, 143. Watt's Dict. Chem., 8, 1338. Russ. Ztschr. Phar., 1873, 641.

AUSTRIAN PHARMACOPŒIA, 1884.—The opium is exhausted with dilute hydrochloric acid and the residue dried and weighed. The solution is treated with sodium chloride and allowed to stand for some time. The solution, after filtering, is treated with ammonia, and the crystals, after dissolving in acetic acid and filtering, are again precipitated with ammonia.

Jour. Chem. Soc, 46, 1217. Jour. Pr. Chem., 29, 97, 110. Phar. Jour. Trans., 15, 384. Jour. Soc. Chem. Indus., 3, 529.

BARTLETT, WM., 1884,—A comparison of the American, British and German Pharmacopœial methods.

Analyst, 9, 200. Proc. Amer. Phar., 1884, 475. Phar. Record, 4, 384.

BERNHARDT, 1884. The opium is exhausted with water, and the solution evaporated to a small bulk, and ether and ammonia is added. The ether is decanted, and the crystals of morphine washed, dried and weighed.

Jour. Soc. Chem. Indus., 3, 529. Sweiz. Wochenschrift, 22, 9598. Fehling's Handwoerterbuch, 4, 881.

BERTHEMOT, 1838.—Am. Jour. Phar., 10, 318.

BLEY, 1850.—Jahr. der Chem., 3, 423.

BLEY AND DIESEL., 1846.—This method is the same as that given as Boussingault and Payen, except in purifying the morphine with animal charcoal.

Berzelius' Jahr., 25, 514.

BOUSSINGAULT AND PAYEN, 1846.—The opium is exhausted with water, the solution treated with lime, and acidulated with hydrochloric acid. The morphine is precipitated with ammonia and crystallized from its alcoholic solution.

Berzelius' Jahr, 25, 513.

BRITISH PHARMACOPŒIA, 1885.—Hager-Jacobsen's method as given in the U. S. P.

British Pharmacopœia, 1885, 296.

CHOULANT, 1821.—The opium is exhausted with water. The solution is treated with ammonium oxalate to remove the lime, and with barium chloride to remove the sulphuric acid. The morphine, after precipitating with ammonia, is dissolved in acetic acid, and again precipitated with ammonia.

Ure's Dictionary of Chem., 2, —.

CLEAVER, E. LAWRENCE, F. C. S., 1876.—A report on opium assays; also, an original method.

The opium, after treating with benzol or carbon bisulphide, is exhausted with water and lime; the solution is neutralized with sulphuric acid, and the morphine precipitated with ammonia.

Pharm. Jour., 7, 240. Am. Jour. Phar., 48, 499. Archiv. Pharm., 23, 177. Br. Yearbook Phar., 1876, 502. Jahr. der Pharm., 1876. 175. Proc. Am. Phar., 1878, 272. Hager's Pharm. Praxis, 822. Huseman's Pflanzenstoffe, 674.

CONROY, MICHAEL, F. C. S., 1884.—The U. S. P. process slightly modified. From 100 parts of liquid a little over 50 are taken, and for precipitation less ammonium chloride is used. Also a criticism upon the U. S. P. method.

Phar. Jour. Trans., 15, 473. Br. Yearbook Phar., 1885, 202. Phar. Record, 5, 8.

COUERBE, 1830.—The opium is exhausted with water, the solution treated with milk of lime and neutralized with hydrochloric acid, and the morphine precipitated with ammonia.

Hager's Pharm. Praxis, 822. Archiv. Pharm., 5, 39; 10, 211. Ann. Chem. Phar. 17, 172.

DEROSNE, M., 1832.—The morphine is extracted with water and purified with animal charcoal.

Ann. de Chim., 50, 248.

DEVRIJ, 1856.—Guillermond's process modified by removing the narcotine by treating with dilute sulphuric acid and sulphate of copper.

Jahr. der Chem., 1850, 617. Hager's Pharm. Praxis, 832. Pharm. Jour., 10, 77. Huseman's Pflanzenstoffe, 671.

DIETERICH. E., 1886.—The morphine is extracted with water, the solution treated with a little ammonia, filtered, an aliquot part taken, more ammonia added, and the crystals weighed in a flask.

Pharm. Rundschau, 1886, 279. Experiments upon the shaking, as to its influence on the precipitate. Pharm. Rundschau, 1886, 259. Am. Druggist, 1887, 4. Fortschritt, 1887, 73, 93. Pharm. Centrh., 21, 261. Pharm. Era, 1887, 325.

DOUX, G., 1885.—A modification of Regnault's process. The opium is exhausted with alcohol, an aliquot part of the liquid taken, then treated as in Regnault's process.

Chem. News, 52, 189.

DUBLANC, 1866.—The morphine is extracted with water acidulated with sulphuric acid, precipitated with infusion of galls, treated with lime, and extracted with alcohol.

Archiv. Pharm., 125, 51.

DUFLOS, 1833.—The opium is exhausted with water, the solution treated with potassium bicarbonate to precipitate the narcotine. The solution is boiled until the acid carbonate is changed to the normal, precipitating the morphine, which is purified by dissolving in dilute sulphuric acid, and precipitating with ammonia.

Berzelius' Jahr., 12. Hager's Pharm. Praxis, 822.

FINKH, 1867.—The morphine is extracted with brandy, precipitated with sodium carbonate, dissolved in acetic acid, and precipitated with ammonia.

Jahr. der Pharm., 1867, 115.

FLEURY, G., 1867.—The opium is treated with ammonium oxalate, then with alcohol and ammonia; the crystals dissolved in standardized oxalic acid, and excess determined by titrating with decinormal sodium hydrate.

Jahr. der Pharm., 1867, 119. Watt's Dict. Chem., 6, 838. Hager's Pharm. Praxis, 823. Jahr. der Chem., 1867, 868. Huseman's Pflanzenstoffe, 673. Zeitsch. Anal. Chem., 6, 492.

FLUECKIGER, F.A.,1880.—The opium is exhausted with water, the solution treated with alcohol, ether and ammonia, and the crystals weighed. They are again weighed after washing with an ether alcohol solution.

Jour. Chem. Soc., 48, 1165. Archiv. Pharm., 23, 254, 289. Pharm. Jour. Trans., 10, —, —. Zeitsch. Anal. Chem., 19, 118. Phar. Zeit., 24, 432. Jahr. der Pharm., 1878, 183. Proc. Am. Phar., 1880, 170. Hager's Pharm. Praxis, 823. Hoffmann and Power, 3d edition, 435. Berod. Chem. Ges., (Referate,) 1885, 651. Huseman's Pflanzenstoffe, 674.

1885.—A discussion for the Pharmacopœial Commission.

Jahr. der Pharm., 1885, 105.

FLUECKIGER AND HANBURY, 1874.—The morphine is extracted with alcohol, and precipitated with ether and ammonia.

Flückiger and Hanbury's Pharmacography, 63. Encyclopedia of Chem., (Lippincott, Phil.), 2, 491. Am. Jour. Phar., 47, 461.

FORDOS, M., 1857.—The opium is exhausted with water, one-third of the solution titrated with ammonia to find the amount required, the remaining solution treated with a slight excess of ammonia, alcohol added, and the resulting crystals weighed after washing with chloroform and ether.

Am. Jour. Phar., 30, 47. Jahr. der Chem., 1857, 605. Jour. Prakt. Chem., 7, 1. Hager's Pharm. Praxis, 825. Pharm. Jour., 17, 289. Archiv. Pharm., 94, 61; 96, 63. Chem. Gazette, (London), 15, 315.

FRICKER, 1874.—A modification of Schachts' process. Also, a discussion of various methods.

Jahr. der Pharm., 1874, 143. Huseman's Pflanzenstoffe, 674.

GEISELER, 1839.

Archiv. Pharm., 20, 218.

GEISELER, E., 1884.—A modification of Flückiger's method. For the German Pharmacopœia.

Zeitsch. Anal. Chem., 23, 106. Phar. Centr., 24, 183. Br. Yearbook Phar., 1884, 157. Jahr. der Pharm., 1883, 339. Hager's Pharm. Praxis, 834.

GERMAN PHARMACOPŒIA, 1884.—The morphine is extracted with water, the solution treated with spirit, ether and ammonia, and the crystals washed and weighed.

Phar. Jour. Trans., 14, 645. Jour. Soc. Chem. Indus., 3, 529. German Pharmacopœia, 1884, 155.

GODEFFROY.—The opium is exhausted with water, the solution treated with lime, filtered, ammonium chloride added until the solution smells of ammonia, the crystals washed with dilute ammonia and weighed.

Jour. Chem. Soc., 46, 1217. Jour. Pr. Chim., 29, 97, 110. Phar. Jour. Trans., 15, 384. Fehling's Handwoerterbuch, 4, 881. (See v. Perger).

GREGORY, W., 1832.—The opium is exhausted with water, the meconic acid removed with calcium chloride, etc.

Wurtz's Elements of Chemistry, 647. Ann. d Chem., 51, 259. Muspratts' Chemistry, 2, 634.

GUIBORT, M., 1862.—Morphine is extracted with water, precipitated with ammonia, and washed with alcohol.

Zeitsch. Anal. Chem., 1, 381. Watts's Dict. Chem., 3, 1053. Hager's Pharm. Praxis, 825. Wurtz's Dictionaire, 2, 623. Husemann's Pflanzenstoffe, 67.

GUICHARD.—A polarimetric method applied to an aqueous solution of opium, decolorized by treating with the sulphates of copper and ammonia.

Hager's Pharm. Praxis, 825,

GUILLARMOND, A., 1849.—The morphine is extracted with alcohol, precipitated with ammonia, and freed from narcotine by treating with ammonium meconate.

Archiv. Pharm., 61, 193; 67, 328. Pharm. Jour., 9, 236. Watts' Dict. Chem., 3, 1053. Amer. Jour. Phar., 3, 229. Zeitsch. Anal. Chem., 6, 492. Jahr. der Chem., 1849, 607. Hager's Pharm. Praxis, 825. Husemanns' Pflanzenstoffe, 671.

1867.—The morphine is extracted with dilute alcohol, and precipitated with ammonia, added to the bottom of the flask through a tube, without shaking.

Jahr. der Chem., 1867, 869. Jahr. der Pharm., 1867, 120. Gmelin's Handbuch, 16, 423. Watts' Dict. Chem.., 6, 838.

HAGER, 1865.—The opium, after treating with an ammoniacal solution of ammonium oxalate, is exhausted with alcohol; this solution treated with crystallized soda, and the morphine crystals washed with ether and alcohol.

Zeitsch. Anal. Chem., 4, 204. Proc. Am. Phar., 1886, 190. Phar. Centr., 5, 185.

1867.—A criticism of Schachtrupp's process.

Jahr. der Pharm., 1867, 118. Phar. Centr., 8, 431.

1868.—The opium is exhausted with water and lime, and the morphine precipitated by adding ammonium chloride, ether and bezol.

Hager's Pharm. Praxis, 833. Jahr. der Pharm., 1868, 114. Phar. Centr., 9, 1. Husemann's Pflanzenstoffe, 672.

HAGER-JACOBSEN, 1869.—The opium treated with water and lime, an aliquot part of the liquid is taken, the morphine precipitated by adding ammonium chloride, ether and benzol, and washed with chloroform.

Am. Jour. Phar., 47, 460. Jahr. der Pharm., 1873, 141. Phar. Centr., 14, 244. Proc. Am. Phar., 1869, 178. Hager's Pharm. Praxis, 874.

HAINES, R., M. B., 1863.—Method modified from O'Shaughnessay's. The opium is exhausted with alcohol, and the morphine precipitated with ammonia. The narcotine is also estimated.

Am. Jour. Pharm., 35, 266, 337. Chem. News, 7, 65, 89, 98.

HAYS, GEO. D., 1878.—The opium is exhausted with water, the solution treated with calcium chloride, evaporated to a small bulk, dissolved in water, filtered through animal charcoal, neutralized with ammonia, and the crystals weighed.

Archiv. Pharm., 13, 554. New Remedies, 1878, 194. Br. Yearbook Phar., 1878, 56. Pr. Am. Phar., 1879, 484.

HEINTZ, 1872.—A discussion of the Hager-Jacobsen and Stein methods.

Jahr. der Pharm., 1872, 186. Archiv. Pharm., 200, 37.

HERTZOG, 1845.—Modification of Mohr's method.

Berzelius' Jahr., 24, 399.

HOLDEMAN, E., 1880.—A colorometric method, depending upon reduction of iodic acid.

Jahr. der Chem., 1880, 954. Husemann's "Pflanzenstoffe," 675.

JACOBSEN, G. J., 1868.—The opium is exhausted with lime and water, an aliquot part of the liquid treated with ether and benzol, and the morphine precipitated with ammonium chloride.

Jahr. der Pharm., 1868, 119. Nieuw Tijdschrift voor Pharmacie, 1868, 361. Proc. Am. Phar., 1870, 264. Phar. Centr., 10, 244. (See also Hager-Jacobsen, *ante.*)

KIEFFER, 1857.—The solution is freed from meconic acid with calcium chloride, an excess of potassium ferricyanide added, the excess determined by adding strong hydrochloric acid, and titrating the liberated chlorine with hyposulphite of sodium.

Am. Jour. Phar., 33, 218. Ann. der. Chem. Phar., 103, 271. Hager's Pharm. Praxis, 829. Archiv. Pharm., 102, 328. Wurtz's Dictionaire, 2, 623. Husemann's Pflanzenstoffe, 673.

LANGLOIS, M., 1882.—Opium is exhausted with water and lime, two-thirds of the liquid treated with ether and ammonium chloride, and the crystals weighed.

Jour. Soc. Chem. Indus., 1, 466. Hager's Pharm. Praxis, 825.

LEGLER, 1882.—Morphine is extracted with dilute sulphuric acid, precipitated with sodium phospo tungstate, dissolved in dilute sulphuric acid, etc.

Jahr. der Chem., 1882, 1336.

LEPAGE, 1877.—The opium is exhausted with water, two-thirds of the solution titrated with double iodide of potassium and cadmium.

Zeitsch. Anal. Chem., 16, 260. Jahr. der Pharm., 1875, 342. Repert. d. Phar., 21, 613. Phar. Zeit. Russ., 16, 132.

LUDWIG, H., 1871.

Archiv. Phar., 148, 150.

LYAN, 1876.—A comparison of methods.

Jahr. der Pharm., 1876, 175.

LYNN, JAMES, PH. C., 1877.—A comparison of four processes.

Am. Jour. Phar., 48, 358. Archiv. Pharm., 11, 566.

MAISCH.—The opium, after washing with benzol, is exhausted with water, the solution evaporated to a small bulk, filtered, and the morphine precipitated with ammonia.

Hager's Pharm. Praxis, 826. Archiv. Pharm., 148, 58.

MAYER, FERDINAND F., 1863.—The opium is exhausted with alcohol and a solution of baryta, and the solution titrated with Mayer's reagent.

Am. Jour. Phar., 35, 385.—Chem. News, 8, 177 and 189. Jahr. der Chem., 1863, 703. Watt's Dict. Chem., 3, 1053. Hager's Pharm. Praxis, 826. Husemann's Pflanzenstoffe, 674 Dragendorff's Werthbestimmung (1874), p. 86.

MERCK, E., 1867.—The opium is exhausted with alcohol, the solution treated with crystallized soda, evaporated and dried; the residue washed with water and alcohol, dried, dissolved in acetic acid, and precipitated with ammonia.

Jour. Chem. Soc., 46, 1217. Jour. pr. Chim., 29, 97. Phar. Jour. Trans., 15, 384. Jahr. der Pharm., 1867, 115. Hager's Pharm. Praxis., 826. Fehling's Handwoerterbuch, 4, 880. Wurtz's Elements of Chem., 647. (See v. Perger).

1845.—The opium is treated with ether, which solution imparts to white paper a color, due to porphyroxin so called.

Berzelius' Jahr., 24, 399.

MILLER, JOHN T., 1872—An aqueous solution of opium is treated with iodic acid, the liberated iodine taken up by carbon bisulphide, and the color compared with a standard. The colors are equalized by adding carbon bisulphide to the darker.

Jour. Chem. Soc., 10, 181. Phar. Jour. Trans., 11, 465. Pharm. Jour., 2, 465. Am. Jour. Phar., 44, 87. Br. Yearbook Phar., 1872, 223. Proc. Am. Phar., 1873. 127. Hager's Pharm. Praxis, 826. Jahr. der Chem., 1871, 957. Husemann's Pflanzenstoffe, 674. Jahr. der Pharm., 1872, 183.

MOHR, 1868.—The opium is exhausted with water and lime, the solution acidulated and evaporated to a small bulk, and the morphine precipitated with an excess of ammonia.

Am. Jour. Phar., 40, 514. Hager's Pharm. Praxis, 827. Berzelius' Chemie, 5, 27. Huseman's Pflanzenstoffe, 674.

1842.—The morphine is extracted with water, lime added to remove the meconic acid, precipitated by adding ammonium chloride; the morphine is purified with charcoal.

Berzelius' Jahr., 21, 314.

Moss, J. Clark, 1875.—A comparison of the Hager-Jacobsen, and Flückiger-Hanbury methods.

Am. Jour. Phar., 47, 460.

Mylius, E., 1879.—A modification of Flückiger's method. The crystals are weighed upon a filter instead of in a flask, etc.

Jour. Chem. Soc., 38, 829. Archiv. Pharm., 15, 310. Am. Jour. Phar., 52, 14. New Remedies, 9, 53. Br. Yearbook, Phar., 1880. 22. Jahr. der Chem., 1879, 791, and 1880, 1229. Jahr. der Pharm., 1878, 184. Phar. Centr., 21, 115 and 409. Huseman's Pflanzenstoffe, 675.

1880.—A discussion of Flückiger's and Van Den Burg's methods.

Jahr. der Pharm., 1880, 174.

1881.—A colorimetric method based upon that of Neubauer. The opium is exhausted with a solution of lead basic acetate, the solution freed from lead, treated with iodic acid and carbon bisulphide, the color compared with a standard, and equalized by adding carbon bisulphide to the darker.

Jour. Chem. Soc., 40, 945. Phar. Jour. Trans., 12, 609. Chem. News, 47, 118. Archiv. Pharm., 16, 27. New Remedies, 10, 174. Zeitsch. and Chem., 21, 602. Br. Yearbook, Phar., 1881, 215 and 1883, 192. Jahr. der Chem., 1881, 1108. Jahr. der Pharm., 1881, 256. Proc. Am. Pharm., 1881, 198. Hager's Pharm. Praxis, 827. Phar. Centr., 21, 97. Chem. Ber., 1881, 1122. Jahr. der Technologie, 1881, 457. Husemann's Pflanzenstoffe, 675.

Neubauer.—The same as Stein's, but using carbon bisulphide instead of chloroform, and titrating.

Jour. Phar. Trans., 12, 6.

O'Shaughnessy.

Am. Jour. Phar., 12, 141.

PAYEN.—The morphine is extracted with water, the solution treated with lime, acidulated with hydrochloric acid, precipitated with ammonia, and the morphine re-crystallized from alcohol.

Hager's Pharm. Praxis, 828.

PERGER, V., 1884.—The opium is exhausted with water and caustic baryta, the solution treated with carbon dioxide, evaporated to dryness, the residue exhausted with absolute alcohol, distilled off and the residue treated with ammonia, and washed with chloroform, leaving the crude morphine. Also, a discussion of the methods of Godeffroy, Merck and the Austrian Pharmacopœia.

Jour. Chem. Soc., 46, 1217. Jour. pr. Chim., 29, 97. Phar. Jour. Trans., 15, 384. Am. Jour. Pharm., 56, 534. Jour. Soc. Chem. Indus., 3, 579. Repert. Anal. Chem., 9, 137. Chem. News, 50, 155. Analyst, 10, 77. Br. Yearbook Phar., 1885, 200. Proc. Am. Phar., 1885, 298. Pharm. Record, 4, 496. Fehling's Handwoerterbuch, 4, 881. Ber. d. Chem. Ges., 1884, 241. Lyons' Pharm. Assaying, 119.

PETERMAN, ARTHUR, 1867.—The opium is exhausted with water and hydrochloric acid, and the residue weighed. The solution is treated with sodium chloride and precipitated with ammonia. The crystals, after dissolving in acetic acid, are precipitated with ammonia. Also, Fleury's and Guillermond's processes.

Zeitsch. Anal. Chem., 6, 492. Hager's Pharm. Praxis, 832.

PETIT, A., 1878.—The opium is exhausted with water, a little more than two-thirds of the solution is shaken with ammonia, and alcohol added.

Pharm. Jour., 9, 937. Archiv. Pharm., 14, 468. Proc. Am. Phar., 1879, 222. Hager's Pharm. Praxis, 828. Husemann's Pflanzenstoffe, 675.

PHARMACOPŒIAL COMMITTEE, 1885.—The opium is exhausted with water, a little more than fifty per cent. of the liquid treated with ether, alcohol and ammonia, and the crystals weighed.

Jour. Soc. Chem. Indus., 4, 687. Archiv. Pharm., 23, 466.

PORTES AND LANGLOIS, 1882.—The opium is exhausted with water and lime, 53 of 70 cc. of the liquid is treated with ammonium chloride, the precipitate washed, weighed, and dissolved in graduated sulphuric acid, and the excess titrated back.

Chem. News, 45, 67. Br. Yearbook Phar., 1882, 148. Jahr. der Pharm., 1881, 255. Proc. Am. Phar., 1882, 232. Husemann's Pflanzenstoffe, 675.

PRESCOTT, PROF. A. B., 1878.—The opium is dried and washed with benzene, mixed with lime and water, and agitated for one hour with nearly boiling water. An aliquot part of the filtered liquid is treated with ether, benzene and ammonium chloride, and the crystals weighed.

Jour. Chem. Soc., 38, 191. Phar. Jour. Trans., 10, 128 and 182. New Remedies, 8, 69 and 103. Br. Yearbook Phar., 1880, 20. Jahr. der Chem., 1879, 792. Jahr. der Pharm., 1878, 186. Proc. Am. Phar., 1878, 807. Hager's Pharm. Praxis, 828. Husemann's Pflanzenstoffe, 675.

1878.—Also for valuation of tincture of opium. A modification of Hager's process.

Jour. Chem. Soc., 38, 193. Phar. Jour. Trans., 10, 66.

PRESCOTT, A. B., AND GEISLER, J. F., 1881.—Experiments on opium assays.

Proc. Am. Phar., 1881, 198.

PROCTOR, B. S.—1876.—Notes on the assay of opium.

Pharm. Jour., 7, 244; 8, 21. Br. Yearbook Phar., 1876, 511; 1877, 528. Proc. Am. Phar., 1878, 274.

PROCTOR, WM., 1870.—The morphine is extracted with water, precipitated with alcohol and ammonia, and washed with ether. Morphinometric processes compared, Miller's and Stein's.

Pharm. Jour., 1. Am. Jour. Phar., 43, 65. Br. Yearbook Pharm., 1871, 287. Jahr. der Chem., 1871, 287. Jahr. der Pharm., 1871, 119. Proc. Am. Phar., 1870, 129. Archiv. Phar., 148, 54. Hager's Pharm. Praxis, 829. Husemann's Pflanzenstoffe, 678.

PROLLIUS, 1877.—The opium is exhausted with water, the solution evaporated to dryness, extracted with 30 per cent. alcohol, and shaken with ether and ammonia.

Pharm. Jour., 8, 582. Am. Jour. Phar., 50, 184. New Remedies, 6, 366. Br. Yearbook Pharm., 1878, 110. Proc. Am. Pharm., 1878, 276. Hager's Pharm. Praxis, 829.

P—s, 1874.—The Hager-Jacobsen process.

Proc. Am. Phar., 1874, 142. Phar. Centr., 14, 244.

REGNAULT.—The morphine is extracted with alcohol, precipitated with ammonia, and washed with chloroform to remove the narcotine.

Hager's Pharm. Praxis, 829. Wurtz's Dictionaire, 2, 623. Regnaults' Elements of Chemistry, 617.

REICH, G., 1851.—The morphine is extracted with alcohol, precipitated with ammonium carbonate, and washed with water and ether.

Am. Jour. Phar., 23, 86. Archiv. Pharm., 61, 143.

REVEIL, P. O., 1871.—A modification of Guillermond's process.

Jahr. der Chem., 1871, 824.

RICE, S. M., 1872.—A method for tincture of opium. The alcohol is evaporated off, the solution filtered, and ammonia and a little alcohol is added.

Br. Yearbook, Pharm., 1872, 367,

RIECKHER, 1868.—A method by titration with potassium mercuric iodide.

Jahr. der Chem., 1867, 889. Jahr. der Pharm., 1868, 117. Proc. Am. Phar., 1869, 179.

REIGEL, 1851.—Guillermond's method modified, removing the narcotine by treating with ether.

Jahr. der. Chem., 1851, 644. Husemann's Pflanzenstoffe, 671.

ROBIQUET, 1821.—The morphine is extracted with water, the solution treated with magnesium oxide, and the morphine dissolved out with alcohol, and crystallized.

Ure's Dictionary of Chem.

1825. The opium is exhausted with a solution of sodium chloride, the solution filtered and evaporated to dryness, and the morphine extracted from the residue with alcohol, and crystallized.

Archiv. de Chim., 30, 208.

ROTHER, 1870. — The morphine is extracted with water, precipitated with sodium bicarbonate, and washed with water, alcohol and ether.

Archiv. Pharm., 17, 75. Am. Jour. Pharm., 1879, 541. Jahr. der Pharm., 1871, 116. Chicago Pharmacist, 4, 145. Proc. Am. Phar., 1880, 323. Hager's Pharm. Praxis, 830. Chem. Record, 9, 151.

ROUSSILLE, 1866.—Guillermond's method modified. The opium is exhausted with alcohol and water, the morphine precipitated with ammonia, and washed with water and ether.

Am. Jour. Phar., 38, 512. Chem. News, 14, 162. Zeitsch. Anal. Chem., 1, 465. Jahr. der Chem., 1866, 824. Jahr. der Pharm., 1866, 106. Proc. Am. Pharm., 1867, 241. Husemann's Pflanzenstoffe, 671.

SAU, PROF., 1853.—The morphine is extracted with water, the solution treated with calcium chloride, filtered, and the morphine precipitated with ammonia.

Am. Jour. Phar., 25, 460.

SAINT PLACAT, 1869.—A modification of Guillemond's method.

Jahr. der Chem. 1869, 942. Jahr. der Pharm., 1869, 106. Hager's Pharm. Praxis, 830.

SCHACLET, J. E., 1863.—The morphine is extracted with water, purified with charcoal, precipitated with ammonia, and freed from narcotine with ether, and from meconate of lime by dissolving in alcohol.

Zeitsch. Anal. Chem., 2, 229. Archiv. Pharm., 114, 118. Jahr. der Chem., 1863, 706. Hager's Pharm. Praxis, 830. Wurtz's Dictionaire, 2, 623. Husemann's Pflanzenstoffe, 672.

SCHACHT, C., 1866. — Various methods with references: Couerbe, Dublanc, Merck, Duflos, Mohr, Thiboumery, Gregory, Guillermond, Reveil, Guibort, Hager, Schacht, Kuffer, De Vrij.

Zeitsch. Anal. Chem., 5, 258. Jahr. der Pharm., 1866, 106. Phar. Centr, 6, 399. Archiv. Pharm. 125, 50. Husemann's Pflanzenstoffe, 672.

SCHACHTRUPP, S., 1867.—The opium is digested with sodium carbonate, and dried, and treated with benzole. The morphine is extracted with hydrochloric acid, and precipitated with ammonia.

Zeitsch. Anal. Chem., 7, 509. Jahr. der Chem., 1867, 870. Jahr. der Pharm., 1867, 782, 111. Watts' Dict. Chem., 6, 838. Phar. Centr., 8, 431.

SCHLOSSER, DR. THEODORE, 1871.—The opium is exhausted with water and lime, a certain part of the solution treated with ammonium chloride and ether, and the crystals washed with chloroform.

Am. Jour. Phar., 43, 224. Zeitsch. Oester. Apoth. Ver., 1871, 118, 16. Jahr. der Pharm., 1871, 418. Archiv. Pharm., 146, 265. Husemann's Pflanzenstoffe, 673.

SCHNEIDER, DR., 1868.—Methods submitted for the sixth edition of the Austrian Pharmacopœia. 1st. The opium is exhausted with water acidulated with hydrochloric acid, sodium chloride added, filtered, the morphine precipitated with ammonia, dissolved in acetic acid, and again precipitated with ammonia. 2d. The opium is exhausted with water, the solution treated with lime, acidulated with hydrochloric acid, evaporated to a small bulk, precipitated with ammonia, and then treated as above with acetic acid and ammonia.

Am. Jour, Phar., 41, 21. Chem. News, 4, 321. Zeitsch. Anal. Chem., 8, 85. Jahr. der Chem., 1868, 889. Jahr. der Pharm., 1868, 121. Zeitsch. Oester. Apoth. Ver., 6, 351. Proc. Am. Phar., 1869, 179. Chem. Gazette, 1870, 190. Hager's Pharm. Praxis., 831. Husemann's Pflanzenstoffe, 675.

1882.—A modification of Stein's method.

Proc. Am. Phar., 1882, 232.

SCHONBROODT.—The morphine is extracted with water and acetic acid, decolorized with charcoal, iodic acid added, and treated with a hypochlorite solution.

Wurtz's Dictionaire, 2,623. Reper. Chim. Appl., 186, 282.

SERTUERNER, 1817.—The morphine is extracted with water, precipitated with ammonia, and purified by dissolving in alcohol and evaporating.

Am. de Chem., 5, 21.

SIEISCH, 1870.—A discussion of various methods.

Jahr. der Pharm., 1870, 192. Zeitsch. Oester. Apoth. Ver., 8, 1 and 37.

SOCIÉTÉ DE PHARMACIE, PARIS, 1881.—The opium is exhausted with water and lime, and two-thirds of the liquid treated with ether and ammonia.

Jour. Soc. Chem. Indus., 1, 515. Repert. Anal. Chim., 18, 284. Br. Yearbook Phar., 1883, 193. Jahr. der Pharm , 1881, 256. Proc. Am. Phar., 1883, 150.

SQUIBB, E. R., 1870.—The opium is exhausted with water, the solution treated with alcohol, washed with ether, made up to the original weight, an aliquot part is treated with alcohol and ammonia.

Am. Jour. Phar., 42. 40, 47 and 53. Proc. Am. Phar., 1870, 79.

1882.—A modification of Flückiger's method. The opium is exhausted with water containing a little alcohol, the solution concentrated, a little alcohol added, and again concentrated, the morphine is precipitated with ammonia and a little alcohol.

Jour. Chem. Soc., 42, 666. Phar. Jour. Trans., 12, 724. Br. Yearbook Phar., 1882, 148. Jahr. der. Chem., 1882, 1335. Proc. Am. Phar., 1882, 229. Squibb's Ephemeris, 1, 14. Hoffmann and Power, 435.

STAPLE.—For tincture of opium. The tincture is evaporated to half its original bulk, cooled, filtered, and the morphine precipitated with ammonia and alcohol.

Jour. Chem. Soc., 38, 193. Phar. Jour. Trans., 10, 66.

STEIN, W., 1869.—The opium is exhausted with water, acidulated with sulphuric acid, the solution treated with sulphate or acetate of copper, iodic acid added, the free iodine taken up with chloroform, and the color noted.

Phar. Jour. Trans., 12, 6. Jour. Chem. Soc., 10, 180. Zeitsch. Anal. Chem., 11, 329. Archiv. Pharm., 148, 150. Br.

Yearbook Pharm., 1872, 222. Jahr. der Pharm., 1869, 107. Hager's Pharm. Praxis, 831. Jahr. der Chem., 1871, 957. Phar. Centr., 13, 63. Huseman's Pflanzenstoffe, 675.

STILLWELL, C. M., 1886.—The Flückiger Squibb method modified by using Teischemacher's wash-liquids for washing the final crystals of morphine.

Am. Chem. Jour., 8, ——. Pharm. Rundschau, 1886, 280.

TEISCHEMACHER'S, E. F., 1877.—The meconic acid is removed as meconate of lead, by treating the solution with lead acetate, the morphine dissolving in the liberated acetic acid. The lead is removed from the solution with sulphuric acid, the solution evaporated to dryness, the residue extracted with alcohol, and precipitated with ammonia. The crystals are washed with "morphiated" spirit and water solutions, saturated with morphine; also with ether and benzene, to remove the narcotine.

Jour. Chem. Soc., 32, 231. Chem. News, 35, 47. Br. Yearbook Phar., 1877, 130. Jahr. der Chem., 1877, 881. Proc. Am. Phar., 1877, 299.

THIBOUMERY, 1839.—The opium is exhausted with water, the solution evaporated to an extract, dissolved in water, the morphine precipitated with ammonia, dissolved in alcohol, filtered through charcoal and crystallized.

Berzelius' Chemie., 5, 26, Archiv. Pharm., 17, 102. Hager's Pharm. Praxis, 832. Am. Jour. Phar., 10, 328.

THOMAS, 1858.—A method using brandy as a solvent for morphine, and sodium bicarbonate for precipitation.

Archiv. Pharm., 94, 194.

THOMSON, DR., 1821.—The morphine is extracted with water, precipitated with ammonia, purified by dissolving in acetic acid, filtering through charcoal, and precipitating with ammonia.

Ure's Dictionary of Chem., 2.

VAN DER BURG, 1878.—A modification of Flückiger's process.

Jahr. der Pharm., 1878, 183. Husemann's Pflanzenstoffe, 675.

VULGERTH, F., 1856.—The morphine is extracted with water, precipitated with ammonium carbonate, dissolved in alcohol, evaporated and weighed.

Archiv. Pharm., 85, 308.

WAINWRIGHT, J. HOWARD, PH. B., 1884.—A modification of Dr. Squibb's process. Also, a criticism of the same.

Phar. Jour. Trans., 15, 990. Am. Jour. Phar., 57, 391. Ber. de Chem., Ges., 1885, (Ref.) 303. Lyons' Pharm. Assaying, 118. Journ. Am. Chem. Soc. VII., 48.

WRAMPELMEIER AND MEINERT, 1886.—Experiments upon the U. S. P. process.

Proc. Mich. S. P. A., 1885–6, 127. Phar. Record, 6, 411.

WHITSTOCH AND PETERMAN.—The Austrian Pharmacopœial method.

Hager's Pharm. Praxis, 833.

YVON, 1828.—Estimation by means of the polariscope.

Jahr. der Pharm., 1378, 185. Hager's Pharm. Praxis, 833. Husemann's Pflanzenstoffe, 675.

ZWICK, G. H., 1870.—A modification of Dr. Squibb's process, washing the powder with ether instead of the liquid afterwards.

Am. Jour. Pharm., 42, 140.

INDEX OF AUTHORITIES REFERRED TO, WITH ABBREVIATIONS.

Am. Jour. Pharm. American Journal of Pharmacy.

Analyst. The Analyst.

Ann. Chem. Pharm. Liebig's Annalen der Chemie und Pharmacie.

Ann. de Chem. Annales de Chemie.

Archiv. Pharm. Archiv der Pharmacie.

Ber. d. Chem. Ges. Berichte der deutschen chemischen Gesellschaft.

Berzelius' Jahr. Berzelius' Jahresberichte.

Br. Yearbook Pharm. Yearbook of Pharmacy (British).

Chem. News. Chemical News.

Ephemeris. Squibb's Ephemeris.

Fehling's Handwörterbuch. Fehlings' Handwörterbuch der Chemie.

Hager's Pharm. Praxis. Hager's Handbuch der pharmaceutischen Praxis.

Husemann's Pflanzenstoffe.

Jahr. der. Chem. Jahresberichte über die Fortschritt der Chemie.

Jahr. der Pharm. Jahresberichte über die Fortschritt der Pharmakognosie, Pharmacie und Technologie.

Jour. Prakt. Chem. Journal für praktische Chemie.

Jour. Soc. Chem. Indus. Journal of the Society of Chemical Industry.

Phar. Centr. Pharmaceutische Centralhalle.

Pharm. Jour. Pharmaceutical Journal.

Pharm. Jour. Trans. Pharmaceutical Journal and Transactions.

Phar. Rundschau. Pharmaceutische Rundschau.

Proc. Am. Phar. Proceedings of the American Pharmaceutical Association.

Reper. Chem. Appl. Repertoire de Chemie. Appliqué.

Zeitsch. Anal. Chem. Zeitschrift der analitische Chemie.

Ure's Dict. of Chem. Ure's Dictionary of Chemistry.

Watts' Dict. Chem. Watts' Dictionary of Chemistry.

Wurtz's Dictionaire. Wurtz's Dictionaire de Chemie.

Query No. 45.

Is an Apprentice in a Drug Store entitled to receive Instruction in Practical Pharmacy from his employer, and to what extent is the latter held to grant a reasonable time for daily study?

By Ottmar Eberbach, Ph. C.

The term apprentice, in general, as now used, does not convey any definite idea as in former years, when the term expressed the existence of an agreement, or contract, binding both the master as well as the employed. Under these indentures, both parties were held to fulfill certain conditions agreed upon as to nature of business or trade. In vocation under consideration, the pharmacist entering a covenant with a boy desiring to learn the art, bound himself to instruct the apprentice in the art through all its branches within an agreed term, receiving, as a compensation, a stipulated sum, or the services of the apprentice for the term agreed upon, free. These arrangements were found, as society emancipated itself, and the popular sentiment developed for free trade and labor, to work injuriously, both to the master and apprentice, as either party would most certainly find ways and means to rid themselves of a compact that had, through conditions, become obnoxious.

The system being abolished by common consent, the practice of making bargains for a term of 3 or 4 years, with graded compensation for service, was established, during which time the apprentice was to be instructed in the mysteries of the art. Also this practice has gradually given way, so that at the present day, engagements are made by the year, month, or week, with remuneration in accordance with the mercantile conditions, and location of the business, based on the services to be rendered for the time of engagement, the question of a pharmaceutical training being entirely ignored and left to the disposition of the party engaged, to make the best of it, if he can manage to pick

up a little here and there of his own accord, during the busy hours from early in the morning to late at night. The employer having only the mercantile advantages or running expenses to conduct his business in view, in the majority of cases, the pecuniary gain, with least amount of labor and study, outweighs the prospects of a thorough professional training and usefulness, by the employed, which, in justice to the young people here accused, be it stated, is not altogether due to the lack of energy and the inclination to take life easy, but to the fact that they have no intelligent comprehension of what hardships and work they will encounter in their career to become efficient pharmacists; that it means years of incessant labor and study, with an ever growing desire to know more of the mysteries developed by natural sciences.

Every pharmacist member of this Association should make it his special duty to point out these features to young men who desire to enter a drug store, with the expressed purpose of becoming a pharmacist, whether he be a man who has had the good fortune of good pharmaceutical training, or whether he became a druggist by the conditions as presented in a new developing country; it would cause many of those who have no liking for study, or lack the ambition to take up pharmacy with the intent and purpose to master it, to reconsider, and take up some other pursuit more to their taste.

The compulsory forms of an apprenticeship are conditions of the past, and will never be revived again, being contrary to the spirit of a free people, and not in harmony with democratic principles and free institutions. Our people are decidedly opposed to special legislation by which personal liberty is tied down, and should it be even for a short period, this spirit is most carefully nursed by the intelligent and educated of our country as one of our best safe-guards of our free institutions, and our profession most certainly does not desire to step down from its social position as an educated class, by attempting to revive matters of the past, rather than to be in the van of social progress. This being conceded, the question how to train and bring up pharmacists, thorough in professional knowledge and usefulness, places itself boldly before the profession at

large, and particularly before this Association, as the prime mover for obtaining for this State an enactment to draw certain limits for practising the art of selecting, preparing and combining medicinal substances correctly, and with positive knowledge of their safety in regard to changes that may take place on mixing, and doses in which they are ordered to be administered.

The conditions of a large percentage of those who have served, and who enter drug stores at present for the purpose of becoming qualified pharmacists, in the sense as the new state of things, under the pharmacy law, will develop, are not in pace with the times, as a few years' service on the Board clearly demonstrates.

Looking at the large number of intelligent, well-posted pharmacists of our State, and at the unprecedented growth of our Association, developing the liveliest interest for everything appertaining to pharmacy, having at our disposition a State institution, provided with a special department for our vocation, of which we can proudly boast, that in regard to results of its work and in reputation, it is second to none in the Union, and equal to many of the best in the world. There must be a possibility to enlist out of these vast sources a body of intelligent organisatory talent, to develop under the auspices of this Association in the course of time, a system for selecting, training and educating pharmacists, with greatest possible advantages to both employer and employe, and an ever growing credit to this Association, as corner stone of the structure we are all laboring on, which will be a permanent guarantee of its stability and growth, it will rear and bring in an element and material into the ranks of this organization in the course of time, of which we will be proud, and a thousandfold rewarded for the labor it may cost.

Having given the subject a great deal of thought as to a practical plan by which to gain ends in view, I must confess there never was a time in which I considered it more difficult and the conditions offered more contrary, to propose some general plan for this State than I do now, after having served two years on the Board where there is every opportunity offered to come into contact with every form of shop-boy training, from

the one who enters a general merchandise store on the frontiers, who, after two, three or four years, presents himself for examination, to obtain a certificate as registered pharmacist, up to those that have had the best of opportunity of acquiring pharmaceutical knowledge.

Convinced that compulsory or obligatory apprenticeship are contrary to the spirit of the people who believe that trade and labor must be free and voluntary, and such regulations, if enacted by legislature, would be inoperative; it is useless to look for a change of things in that direction. We are, therefore, compelled to look elsewhere for an improvement of conditions, we must appeal to the true sense of responsibility and intelligence of our profession, and the sound and practical sense of a free people, bring the subject squarely before them, and the ends in view, that would never be conceded if compulsory means are attempted, will be granted and carried out voluntarily.

In the present state of affairs pertaining to pharmacy in our State, where we have all conditions represented, from those of the most advanced stage of society, to those incidental with the developments of a new country, it is perfectly natural to find that many of the registered pharmacists are incompetent to educate a boy in the arts of pharmacy, for the very reason that they themselves never had the opportunity and satisfaction of such a training; it is a common fact that a party who has been conducting a general merchandise store, driving a stage, or engaging in some other honest vocation through which he has managed to attain a large amount of useful knowledge in all directions, in consequence of which he became one of the leaders, and was looked upon as the learned member of his community—which, in most cases, is really the condition—will lay in a stock of drugs at the request of his neighbors, or some physicians in the neighborhood, to supply the want of a drug store and commence the practice of pharmacy by putting up drugs and compounding medicines.

In due respect for the members of this Association and the registered pharmacists of Michigan, I would very much regret if the statements in this paper should be interpreted as a ridicule on the standing of pharmacy in this State, the subject

being of too vital an importance to leave room for anything of that disposition. It is well understood by our best minds and most enthusiastic pharmacists, that throughout our State, away from cities, and even in some of these, the druggist is a self-made pharmacist, sustained by the community, more for his social standing and personal character rather than for his professional qualifications, and to the credit of most, be it said, along with the study of the mercantile part of the drug trade, fair attention is paid to increasing their knowledge by freely referring to Wood & Bache and Parrish, and as a support of their sense of responsibility, careful statistics show that more serious errors occur, in proportion, among the higher educated pharmacists than among the extemporized pharmacists.

From what has been stated, it must be attributed to these conditions that we have so much superficial qualification among those now engaged in business, and these must have competent clerks, as the State develops, and the requirements of the Board of Pharmacy become more stringent.

This Association being the instigator of the Pharmacy Act, which brought about the conditions under which pharmacy is now practised, is also counsel for the pharmacists of this State, and it is its duty to make it a particular issue in all its gatherings, to give this subject its particular attention. If this view is correct, each individual member, as a constituent, is morally bound to do all he can in assisting any plan or variation from customs, to raise the standard of apprentices, in justice to all parties, with liberal consideration of his business and ability. From this standpoint, all young men who are accepted in a drug store, with the distinct understanding that they be taught all the details of the business, professional and mercantile, have a just, moral claim on the attention of employer, and detailed instructions in the different manipulations, and that the proprietor does not fulfill his obligations by merely allowing his pupil to acquire all knowledge he wants, if he can manage to pick up a little here and there as he rushes from one duty to another, and as no one can make much progress in the way of posting himself on pharmacy, without a reasonable amount of reading, he is morally bound to grant a reasonable time for reading, as a natural consequence of the agreement.

The writer presents here some propositions for consideration, if it be the pleasure of this Association to accept the important subject as one of its main objects for the future.

The druggist who engages a boy should make such an engagement with a positive understanding of the purpose of his entering the employ, whether the boy is hired as a porter or errand boy, for all kinds of general work, or whether he is to be taught the art of pharmacy. In the first cases, the amount of wages is all that is to be considered, and can only be fixed in accordance to conditions by contracting parties; but in case instruction to learn pharmacy is to be given, it is a question of a decidedly professional character, of more prominence than heretofore, on account of the requirements of a pharmacy law, and one which needs careful investigation into the past of the applicant, or selection of young men who are to learn the business, many of whom will, in not many years hence, be members of this Association, and take charge of its affairs.

Our profession is still looked upon as a tributary branch of medicine, and will remain so until we are able to show in its ranks a large proportion of well educated, scientific men, when it will rank fully equal with the medical profession. The candidate should, therefore, have a good elementary education, as furnished in our common schools, although high school education would be preferable; a knowledge of some foreign language, German or French, would be so much the better. He should be of a frank and thoroughly honest disposition, and ambitious to learn and acquire perfection in the semi-scientific processes of pharmacy. The engagement should be on the basis of not less than four years; the first year should be a trial year to establish whether the boy takes any interest in the practice of pharmacy and study of natural sciences; if he should prove adverse, he should be dissuaded from following the business by friendly reasoning; if useful, he should be bound for at least the second year, and it should not be considered wrong if, after the expiration of the second year, he leaves his employ, in good faith, for the express purpose only of attending some acknowledged school of pharmacy for completing his education and acquiring a college diploma.

On making an engagement, it should be expressly stipulated that the young man should be allowed one to two hours daily for pharmaceutical or professional reading, selecting such hours not later than 8 o'clock, P. M., least detrimental to the best interests of the business, and that the employer make it his especial duty that this be complied with, allowing no other reading in the stipulated time; the master should instruct the apprentice in practical pharmacy by ordering him to make preparations under his supervision, and thoroughly on the subject of weights and measures, temperatures, in the principles of specific gravity, percolation, filtration, evaporation, distillation, etc., always having in view positive results, taking care of drugs, and to observe all general principles of neatness, exactness, and a gentlemanly attitude.

In order to protect the employer, and give due reward for obligations connected with such, or similar, arrangements, the question of compensation is one of vital importance, and must be regulated by the contracting parties, according to conditions of each case, in all events it should be very small the first two years, so that in case the young man leaves after the expiration of the second year, the proprietor shall feel himself compensated for his trouble. Should the employè stay his time out, three or four years, as the case may be, the contracting parties can equalize compensation by graded higher salaries for third and fourth year.

To sum up the drifts of these remarks, if pharmacists engage young men for the purpose and understanding of making them pharmacists, select such as have availed themselves of a liberal education, and can show a good school record; make conditions so that you can afford a liberal time for study, without sacrificing your own means, and allow them to make as many as possible of such galenical preparations as you can under your supervision. If you need errand boys, or some help for general labor, hire them with strict understanding of their duties, instead of several boys who enter your employ with expectation of being instructed in theoretical and practical pharmacy, by so doing the apprentice will have more time and opportunity to become proficient in the store, and at the same time make himself more remunerative and useful.

With these considerations, I will leave the recommendations to the judgment and practical sense of this Association, having the advancement of our vocation, as a profession, in view, and the best interests of employer and employè at heart.

ANN ARBOR, MICH., July, 1887.

DISCUSSION.

Prof. PRESCOTT—The paper just read is one of very great importance from an educational point of view, and I should be glad to hear some expression on it, short as our time is, and it even occurred to me during its reading that some special action might be taken with reference to it.

Mr. WELLS—In listening to this paper it seemed to me that it was a very admirable production, and for myself I thank Mr. Eberbach that he has presented the paper to us. I believe nearly every one of us are guilty of not paying sufficient attention to the education of our apprentices and clerks, and this paper calls my attention to that negligence, and it seems to me of great value. The suggestions made are all valuable, and I sincerely hope we shall go home, even if we take no action to-day, resolved to give a little more attention to the education of those under our care. It is a duty we owe to them and we may indeed find our profit in doing it.

Mr. BROWN—I wish to add my voice in praise of the suggestions of this paper, which I have listened to with a great deal of interest. Some of these suggestions I have endeavored for a number of years to carry out, especially the one relating to the giving of a certain amount of time each day to the boys in my employ for study. I have made it a rule in engaging young men that for the first two years at least they should have their time every evening after half past seven for study. I am sorry to say, however, that a good many of them did not use the time for that purpose, as I afterward learned, and during the reading of the paper it occurred to me if every pharmacist would have some place in his store somewhat secluded, where he could place a young man after a certain hour, say half past seven or eight in the evening, and require him to do a certain amount of study,

say for an hour or an hour and a half, and see that he did it, it would be a good plan. You could know what sort of reading he was doing and you could direct him and see that he began right and went on in a systematic way. I think if we allow young men to leave the store, especially in the summer, they will spend the time in some sort of amusement, rather than go to their homes to study. I think we should all feel under obligations to Mr. Eberbach for the suggestions he has made, and I hope it will leave its impress upon every member of this association, and that we shall go home with the determination to use stronger efforts in the future to encourage our young men to apply themselves to a systematic course of study during their years of apprenticeship.

Query No. 33.

Under what Conditions is Cocaine Liable to Change into Amorphous Alkaloid? Is Hygrine a Definite Compound?

By Frederick G. Novy, Ann Arbor.

One of the by-products in the manufacture of cocaine is amorphous in form and has received the names, *cocaicine* and *cocainoidine*. It has been studied by Lyons, Bender, Squibb and Stockman, but, so far, no ultimate analysis of it has been made. It can be obtained by allowing an alcoholic solution of crude cocaine to evaporate. When all the cocaine has crystallized out there remains a yellowish, syrupy liquid which does not crystallize readily. The hydrochloride of this amorphous substance is very difficult of crystallization. It gives an immediate reduction of potassium permanganate in the cold, and the precipitate thrown down by excess of permanganate is more or less brown; on heating, now, it yields the odor of oil of bitter almonds.

From a consideration of the general reaction of cocaine, it seems that the so-called amorphous alkaloid is not a definite compound, but is rather a mixture of cocaine and its decompo-

sition products. This view is a very plausible one, especially when it will be remembered with what ease cocaine can be saponified. Again, the hydrochloride of benzoyl-ecgonine and ecgonine, which are formed by this decomposition, are, as is well known, difficult of crystallization. Furthermore, benzoyl-ecgonine readily reduces permanganate in the cold, and when heated with an excess of permanganate it gives off an odor of oil of bitter almonds (benzoic aldehyde). Plenske has recently examined the reducing power of the amorphous salt and found that 5 cc. of a (1:1000) solution will reduce from 20 to 40 drops of a (1:1000) permanganate solution. A solution of benzoyl-ecgonine hydrochloride of the same strength will reduce over 20 drops of that permanganate solution.

To decide under what conditions cocaine was liable to be converted into amorphous alkaloid, and at the same time to find out the real nature of this substance, a large number of experiments were made. The cocaine hydrochloride used was well crystallized and found to be free from amorphous alkaloid. Without going into detail, the following general conclusions with the results obtained are given.

1st. Cocaine hydrochloride when heated alone from 3 to 12 hours at 50° C. is not rendered amorphous, but crystallizes afterwards readily and completely.

2d. Cocaine hydrochloride heated with water or alcohol for 3 to 12 hours at 50° C., suffers a slight decomposition with the formation of a little amorphous substance, the greater portion of the salt recrystallizing in the usual manner from alcohol.

3d. Cocaine hydrochloride, heated with dilute mineral acids, such as hydrochloric and sulphuric, under the same conditions as the preceding, is almost entirely rendered amorphous, so that very little crystalline residue is deposited from alcoholic solution.

4th. Cocaine hydrochloride, heated with sodium carbonate and a little water from 3 to 12 hours at 50° is very largely changed into an amorphous condition.

5th. Cocaine heated with boiling water readily splits up into ecgonine and benzoyl-ecgonine.

6th. Cocaine, in contact with water at the ordinary temperature suffers decomposition, and the products formed are soluble in water. Their hydrochloride is amorphous.

7th. A mixture of benzoyl-ecgonine hydrochloride and cocaine hydrochlorides is difficultly crystallizable, especially when the per cent. of cocaine is small. A mixture containing 20 per cent. of cocaine hydrochloride still retains its syrupy condition. A mixture of equal parts of the free alkaloids remains amorphous for some time when exposed to the air, but over sulphuric acid it gradually solidifies into a hard, transparent, non-crystalline amorphous mass, free from crystals.

From these experiments *it would seem that the amorphous alkaloids* (cocaicine and cocainoidine) *are not distinct substances, but are decomposition products* (*benzoyl-ecgonine and perhaps ecgonine hydrochlorides*) *containing a little cocaine hydrochloride in solution.*

In conclusion, it may be remarked that Stockman has lately put forward the view that the amorphous alkaloid is a mixture of hygrine and cocaine.

IS HYGRINE A DEFINITE COMPOUND?

This alkaloid, if such a one really exists, has never been isolated, and it seems more than probable that it is but a complex mixture of several bodies. Lossen (1865), in his examination of the alkaloids of coca leaves, obtained, besides cocaine, another substance to which Wöhler gave the name *hygrine.* He obtained it in the following manner: The slightly alkaline mother liquor from which cocaine has been extracted by ether, was saturated with sodium carbonate and then repeatedly extracted with ether. On evaporation of the ethereal extract, there remained a brown liquid of a high boiling point, and of strongly alkaline reaction. It possessed a burning taste and an odor strongly resembling that of trimethylamine. He further states that its hydrochloride is well crystallizable but very deliquescent. With platinum chloride it gives a flocculent amorphous precipitate which decomposes on the heating of the liquid. Mercuric chloride produces a milky turbidity. Iodine

in potassium iodide and stannous chloride also give precipitates. A few drops of it given to a rabbit had no effect. It can be distilled with water: distills alone between 140° C and 230° C. It is soluble in water, alcohol and ether.

Of late years the term hygrine has been used very loosely and made to apply to almost any semi-liquid mixture obtained in cocaine manufacture. By some the mydriasis produced by cocaine has been ascribed to this hypothetical compound, for such we must regard it. Coca leaves from which cocaine has been extracted, when distilled with sodium or calcium hydrate, yield an alkaline reacting liquid (*the hygrine of Bignon*), having the odor of ammonia and of trimethylamine. On the other hand cocaine itself, even if digested at the boiling temperature for three days, with concentrated baryta solution, will not give off any volatile amine compound.

Calmels and Gossin, as well as Merck, have shown that barium ecgonate, when subjected to dry distillation, yields a *volatile oily liquid*, which is a tropine in composition. In its reactions it strongly resembles the so-called hygrine. Thus: It is soluble in water, alcohol, chloroform and ether; from water solution it can be extracted by chloroform only *after saturation by alkali.*

The hydrochloride is crystalline. Platinum chloride gives a voluminous precipitate which becomes crystalline—that of hygrine is said to be amorphous. When this tropine is decomposed it yields methylamine.

While, therefore, we have no positive evidence going to show that the so-called hygrine is identical with tropine, nevertheless there seems to be an interesting connection between the two. It is a known fact that cocaine, while in the leaves, will under suitable conditions, undergo decomposition into benzoyl-ecgonine and even ecgonine. We can readily suppose this decomposition process to proceed still further and result in the formation of a tropine or even traces of methylamine.

It was desirable to sustain this view, if possible, by actual analysis of the mixture hygrine, but unfortunately the quantity of coca leaves at disposal was too small to permit any extensive investigation.

Query No. 32.

How Does the Spirit of Camphor Used in Filling Physician's Prescriptions Compare in Strength with Present Pharmacopœial Requirements?

By Geo. McDonald, Kalamazoo, Mich.

In all, 38 samples were procured from different parts of the State, six from Grand Rapids, four from Owosso, five from Ann Arbor, six from Detroit, six from Ionia, seven from Kalamazoo, and four from Muskegon.

Four test samples were made as follows:

1. U. S. P. 1870, 2 ozs. camphor to 1 pint alcohol.

2. U. S. P. 1880, 10 parts camphor, 70 parts alcohol, 2 parts water.

3. 1 oz. camphor to 1 pint alcohol.

4. 1 oz. camphor to 1 pint diluted alcohol.

It was the intention to test these samples both as to specific gravity and by precipitating the camphor by means of water, and weighing the precipitate. The latter method, however, was found to give such discordant and varying results that it had to be abandoned. The camphor when precipitated and left on the filter, evaporated so rapidly that it was found impossible to obtain anything like constant results. The specific gravity test was therfoere the only one that was applied. All the samples were weighed at nearly uniform temperature—about 70° F.

The specific gravity of spts. camph. U. S. P. 1880, was found to be .876.

The specific gravity of spts. camph. U. S. P. 1870, was found to be .835.

The specific gravity of spts. camph., 1 oz. camph. to 1 pint alcohol, .825.

The specific gravity of spts. camph., 1 oz. camph. to 1 pint dil. alcohol, .935.

These test samples were adopted as a standard for determining, in an approximative way, the character of the samples purchased through the State. The following table gives the result of all the weighings, at a temperature of about 70° F.

No.	1	Sp. gr.	.875	No.	14	Sp. gr.	.899	No.	27	Sp. gr.	.884
"	2	" "	.869	"	15	" "	.894	"	28	" "	.835
"	3	" "	.827	"	16	" "	.865	"	29	" "	.893
"	4	" "	.891	"	17	" "	.887	"	30	" "	.868
"	5	" "	.830	"	18	" "	.885	"	31	" "	.835
"	6	" "	.910	"	19	" "	.869	"	32	" "	.876
"	7	" "	.866	"	20	" "	.899	"	33	" "	.890
"	8	" "	.858	"	21	" "	.885	"	34	" "	.860
"	9	" "	.879	"	22	" "	.834	"	35	" "	.874
"	10	" "	.831	"	23	" "	.831	"	36	" "	.883
"	11	" "	.875	"	24	" "	.892	"	37	" "	.923
"	12	" "	.869	"	25	" "	.840	"	38	" "	.893
"	13	" "	.877	"	26	" "	.825				

These results were classified as follows:

Two of the samples ranged in specific gravity from .825 to .827.

Seven of the samples ranged in specific gravity from .830 to .840.

Nineteen of the samples ranged in specific gravity from .858 to .878.

Ten of the samples ranged in specific gravity from .889 to .923.

Out of the nineteen ranging from .858 to .887, there were six ranging from .874 to .879. It is probable that all of these nineteen were intended to be in accordance with the U. S. P. 1880.

The seven ranging from .830 to .840 were probably made after the formula of the U. S. P. 1870.

The two weighing respectively .825 and .827 would appear to consist of 1 oz. camphor to 1 pint alcohol.

The ten remaining ones ranging from .889 to .923 contain an undue proportion of water, and are therefore necessarily deficient in camphor, that weighing .923 containing nearly as much water as alcohol.

It would appear from the above that one-half of the samples of spts. camphor examined were at least approximatively pharmacopœial, and that nearly one-fourth were deficient, both in camphor and in alcoholic strength.

Although it is no part of the query, the writer is of the opinion that the Committee of Revision of the U. S. P. 1880, erred in making the alcoholic strength of spts. camphor *lower* than in the U. S. P. of 1870. There are many preparations in common use, more particularly liniments containing essential oils, which with the spts. camphor of the U. S. P. of 1870, made a clear solution, but with that of 1880, produce a turbid and unsightly one, requiring a shake label. While he can understand why the camphor strength was changed to 10 per cent., he has never been able to find a satisfactory reason for reducing the alcoholic strength of the preparation.

The writer is aware that, in at least one respect, this paper is quite deficient. That is, no determination of the camphor, as such, in the various samples, has been made. He thinks this will be found a very troublesome thing to accomplish with any degree of accuracy. The writer tried one method, that of precipitation with water, but it failed signally. Owing to the lack of the needed time he was unable to experiment with other methods. In a conversation with Dr. A. B. Lyons on the subject, he suggested that it might perhaps be accomplished by a method based on determining how much of an alcoholic solution of camphor of known strength would *at once* make a *clear* solution with a given quantity of water. Such a method would certainly be worthy of a trial.

Query No. 22.

Which are the Most Uniform in Strength, Preparations made by Weight or by Measure?

By A. B. Stevens, Ph. C., Ann Arbor.

This subject has ever been an important one, especially so since the adoption of parts by weight in the last U. S. P.

Much difference of opinion seems to exist as to the relative merits of the two methods.

I have endeavored to answer this query by actual experiment. I therefore requested ten of the laboratory students to prepare samples of dilute hydrochloric acid. Each student prepared two samples, one by weight, the other by measure, and each prepared two samples of aromatic sulphuric acid, one by weight, the other by measure, except the acid, which was weighed, in accordance with the directions of the U. S. P., 1870.

One student prepared 20 samples of dilute sulphuric acid, ten by weight and ten by measure.

The same weights and measures were used in each case. The amount of acid was then estimated in the sixty samples, with results as follows:

No.	Dil. HCl, By measure. Per cent. of ac.	Dil. HCl. By weight. Per cent. of ac.	Ar. H_2SO_4 By measure. Per cent. ac.	Ar. H SO By weight. Per cent. ac.	Dil. H_2SO By measure. Per cent. ac.	Dil. H_2SO By weight Per cent. ac.
1	11.4	11.57	15.58	14.21	11.45	9.595
2	11.5	11.5	15.87	14.4	10.48	9.8
3	12.	11.72	14.11	14.11	9.5	9.59
4	11.21	12.23	15.48	15.22	10.09	9.5
5	12.08	11.5	20.2	13.52	10.78	9.3
6	10.05	11.4	14.11	13.71	8.25	9.8
7	11.57	11.64	18.26	15.97	9.21	9.69
8	11.9	11.64	21.07	12.26	10.78	9.69
9	11.8	11.9	15.47	14.11	10.18	9.8
10	12.23	11.57	15.68	13.72	10.04	9.44
Max	12.23	12 23	21.07	15.97	11.45	9.8
Min	10.05	11.40	14.11	12.26	8.25	9.3
Dif.	2.18	.83	6.96	3.71	3.2	.5

From the above* it will be seen that preparations made by weight are much more uniform than those made by measure.

The question which now arises is this: Does the use of weight insure enough *greater* accuracy to warrant their use in place of measures? Observation and experience would seem to demonstrate that it does. Some have said that chemists who aim to obtain a high degree of accuracy use measures in their estimations, as in volumetric analysis. But they should remember that the apparatus for volumetric analysis is so finely adjusted by the use of narrow tubes or cylinders and floats that even an infinitesimal drop can be recorded with accuracy.

Should manufacturers use the same care, there would be but little use for the weighing of liquids. Manufacturers of graduates are, to a certain extent, endeavoring to accomplish this by manufacturing graduates much less in diameter than formerly. Should measures be used as narrow in diameter as the metric cylinders in common use, and which were found to be accurately graduated by careful tests, the great objection to measuring liquids would be at once overcome. Under *those* conditions, the writer might favor their use, as it seems a great inconvenience to some to weigh liquids, though the inconvenience seems many times to exist in the imagination rather than in reality.

The arrangement of the U. S. P., using parts by weight to make 100 or 1000 parts, is considered by some as equivalent to the adoption of the metric system. While this is not the case, it is certainly much more convenient to use them.

DISCUSSION.

Dr. LYONS—I am glad this subject has been dealt with in this very practical manner. The result of experiments such as those described, is more convincing than any argument.

At the meeting of the Missouri State Pharmaceutical Association, a resolution was passed, on the motion of Dr. Whelpley,

* The table is further instructive as illustrating the absolute deviations likely to occur in ordinary practice. Theoretically dilute hydrochloric acid should have a strength of 10 per cent.; the average above is about 11.64 per cent. Aromatic sulphuric acid should contain, when freshly made, 19.2 per cent. of H_2SO_4, average above, made by measure 16.58, *made by weight only* 14.1%. Dilute sulphuric acid should contain 10 per cent. of acid, averages above 10.106, and 9.62 per cent. respectively.—ED.

that it was the sense of that Association that in making preparations according to the pharmacopœia, partsby weight should be used. I do not offer any similar resolution here at this time, simply because there is but a mere handful of us present at this session, and it would not be fair to represent our action as embodying the sense of the Association; but I do think we are all of us pretty strongly impressed in favor of the use of weights instead of measures, especially when we consider how untrustworthy, at best, are the graduates we use, and how difficult it is to obtain accurate measures with the ordinary graduate on account of its shape.

Volunteer Paper.

The Morphine Strength of Tincture of Opium Dispensed in this State.

By Abr. Van Zwaluwenberg, Ph. C.

Twenty-five samples were obtained at retail drugstores, eleven in Detroit, six in Ann Arbor, and eight in cities in Western Michigan. The specific gravity was taken, and each sample assayed by the U. S. Ph. process slightly modified. Thirty-five cc. of the tincture was evaporated to dryness on the water-bath, the residue treated with 1.5 grains dry slacked lime and 35 cc. of water, the whole thoroughly mixed and set aside for one-half hour. Twenty-five cc. of the liquid, filtered and treated in a two-ounce flask with 2.5 cc. of alcohol and 12.5 cc. of ether, was treated with five grains of ammonium chloride, shaken and allowed to stand twelve hours. The ether was decanted upon a small filter, the contents of the flask washed with 5 cc. of ether and also poured upon the filter. The flask was rinsed with 5 cc. of water and this also used to wash the filter. The whole dried and the crystals of morphine returned to the flask and weighed:

No.	Sp. gr.	Per Cent. Morphine.	Grs. Morphine. (per fld. oz.)
1	.958	1.284	5.61
2	.951	.794	3.46
3	.940	.512	2.15
4	.948	.995	4.31
5	.957	1.195	5.16
6	.969	.628	2.76
7	.956	1.107	4.83
8	.950	.801	3 50
9	.959	1.376	6.08
10	.941	.500	2.09
11	.945	.859	3.74
12	.950	1.084	4.70
13	.958	1.299	5.68
14	.946	1.046	4.52
15	.950	.688	2.90
16	.966	.755	3.33
17	.941	.787	3.17
18	.955	1.083	4.72
19	.960	.940	4.12
20	.946	.988	4.27
21	.950	1.042	4.53
22	.946	.914	3.95
23	.950	.957	4.20
24	.950	.668	2.90
25	.948	.793	3.43
Average	.9436	.9216	4.0029

Volunteer Paper.

Does the Pharmacopœial Process for Making Syrup of the Phosphates of Iron, Quinine and Strychnine Furnish a Satisfactory Preparation?

By C. E. Foote.

The formula of the Pharmacopœia is as follows:

	Parts.
Phosphate of Iron	133
Quinine	133
Strychnine	4
Phosphoric Acid	800
Sugar, in coarse powder	6,000
Distilled water a sufficient quantity to make	10,000

Add the phosphate of iron to 2,500 parts of distilled water, in a tared bottle large enough to hold the finished syrup, and agitate frequently until the salt is dissolved.

Having added the phosphoric acid to the solution, triturate the quinine and strychnine gradually with the mixture, in a mortar, until they are dissolved, then return the solution to the bottle and add enough distilled water to make the liquid weigh 4,000 parts. Lastly, add the sugar, dissolve it by agitation, without heat, and filter through paper. Keep the syrup in small, well-stopped vials, in a cool and dark place.

As pharmacists, in considering this question, we must take into account (*a*) ease of manufacture, (*b*) perfectness of solution, (*c*) permanence.

Before starting to make this preparation, I thought it best to examine the constituents and see whether those which I had on hand met the requirements of the last Pharmacopœia.

I found the phosphate of iron in stock a very different article from that now officinal, it being the insoluble ferrous phosphate in a slate-colored powder, formerly officinal, while that of the new Pharmacopœia is a combination or mixture of ferric phos-

phate and potassic citrate in green scales readily soluble in water. This latter preparation is one I had never seen and, I believe, is not usually sold or kept in stock, even by the jobbing druggist. Here, then, is a great chance of mistaking the direction of the Pharmacopœia, since it does not say "phosphate of iron in scales," but simply "phosphate of iron."

My first work was to prepare a phosphate of iron in scales after the 1880 process for making. This operation took about two days and made a very satisfactory product in beautiful, soluble, apple-green scales.

I then proceeded to make the syrup, using parts by weight as directed. The phosphate of iron and the alkaloids dissolved promptly, the sugar was all dissolved by agitation in less than half a day, and the syrup was ready for filtering.

Now came the only difficulty experienced in making the syrup. The Pharmacopœia directs to filter through paper. The density of the syrup makes this a very slow process. The quantity made by me in this experiment, about ten ounces, took two weeks to filter, and then the operation was not quite complete.

This provision of the Pharmacopœia seems to me entirely unnecessary. If the idea is to guard against any undissolved strychnine appearing in the finished syrup, this can as well be done by filtering before adding the sugar, and after dissolving the sugar, straining in the ordinary way.

The syrup as prepared in strict accordance with the Pharmacopœia was of a light greenish-yellow color and very disagreeable, bitter taste. A portion left in a bottle not full and exposed to the light, turned to a brownish-red color, with some deposit of basic phosphate of iron. Another portion, kept in a cool place, protected from the light, shows much less change of color and less deposit in the bottom of the bottle.

In conclusion, and borrowing somewhat from the language of the United States Dispensatory: "This new officinal," introduced apparently as a concession to elegant pharmacy, to which belongs the much-used elixir of the phosphates of iron, quinine and strychnine, "is a very ineligible preparation, and has not

even an agreeable taste to excuse its polypharmacy." Nobody can swallow it. It should be dismissed.

JACKSON, MICH.

DISCUSSION.

Dr. LYONS—I would like to inquire as to the permanence of the preparation?

Mr. FOOTE—I should say it was quite as permanent as other syrups, and as the elixir.

Dr. LYONS—My own experience is that syrups containing citrophosphates of iron are peculiarly liable to fermentation.

Mr. FOOTE—I intended to bring a sample with me. It did not ferment at all. When I looked at it on Friday, before leaving, it had changed color somewhat, but had not fermented. It did not change materially.

Prof. PRESCOTT—How long had it been kept?

Mr. FOOTE—I could not say exactly; I should say it was made three months ago, but I am not certain about that. It was made immediately after you invited me to take the query.

Mr. GUNDRUM—I have made this same preparation in as large a quantity as half a gallon, or a gallon. When it has stood from three to six months it changes color, and throws down quite a precipitate. I have never tried to filter it through paper, but I could see without following the pharmacopœia that it would be a tedious operation. It always changes color after a few months, and throws down quite a precipitate.

Query No. 7.

A Simple Method of Estimating the Quantity of Glycerin in Fluid Extracts, etc., is Desired.

By A. J. Baumhardt, School of Pharmacy, University of Michigan.

Two methods already known have been subjected to trial by the writer. Only one of these methods has the merit of simplicity of operation, called for under the query sought to be answered. The other method, of recent introduction, is a more elaborate operation, requiring some chemical training on the part of the operator, but it was tried in order to learn how the two methods would compare with each other in respect to absolute accuracy.

I. As a simple method, that of Reichardt and others,*—a method of separating the glycerin by solution in alcohol or ether-alcohol in presence of caustic lime—was tried as follows: To 5 cc. of the fluid extract, there were added 0.5 gram of freshly slaked lime, and the mixture in a long-necked flask, was evaporated to dryness upon a water-bath. The residue was treated with a mixture of 7 cc. of ether and 23 cc. of alcohol of 95 per cent. by volume. After several hours digestion the mixture is filtered, and the filtrate evaporated in a long-necked flask on a water-bath till the residue attains a constant weight. Or the residue, as soon as dry, was treated again with the same solvent, and the second filtrate evaporated. Absolute alcohol may be taken, in some separations, with or without the small admixture of ether, according to the solubilities of the material to be rejected. The final residue is obtained with some precaution against loss by absolute vaporization of glycerin. If in a shallow dish, slight additions of alcohol, or ether-alcohol, are

* E. Reichardt, 1875: Archiv. d. Phar. [3] 7, 408; Zeitsch. anal. Chem., 17, 109.
Neubauer and Borgman, for estimation of the glycerin of wines, 1878: Zeitsch. anal. Chem., 17, 445.
A. B. Prescott and O. H. Koehnle, 1878: New Rem., New York, 7, 354.
V. Griessmayer, 1880: Zeitsch. anal. Chem , 19, 104; Ber. d. chem. Ges., 11, 292.

made from time to time near the close of the evaporation. A constant weight is best reached in a flask. The final residue is weighed as glycerin. The results obtained by this method are placed after the directions for method II., in comparison with results by the latter.

II. As a method aiming at exactness, that of BENEDIKT and of Fox,* by oxidation of the glycerin to oxalic acid and determination of the quantity of the latter, was tried at some length. The aqueous solution of the glycerin, in quantity to contain not over 0.25 gram of the latter, is make alkaline by addition of 5 grams of solid potassium or sodium hydrate, when at ordinary temperature, powdered permanganate of potassium is added until the solution is permanently pink, after which the whole is heated at the boiling point for half an hour.† Manganese dioxide precipitates. The red mixture is now treated with sulphurous acid enough to decolor it, filtered clear, acidified permanently with acetic acid, heated to boiling, and fully precipitated by calcium acetate or chloride. The produced calcium oxalate, the measure of the glycerin oxidized, may be estimated volumetrically or gravimetrically. The precipitate is apt to contain calcium sulphate or silicate; if it be pure oxalate, it may be ignited to carbonate (adding ammonium carbonate at the end) and weighed as calcium carbonate. Volumetrically, it may be estimated with standardized permanganate; or may be titrated with excess of standard hydrochloric acid and brought back to neutral point with standard alkali. One molecule (92 parts) of glycerin yields one molecule (90 parts) of oxalic acid (as $H_2C_2O_4$).‡ Therefore the quantity of the glycerin is $\frac{92}{100}$ of the calcium carbonate obtained; or, $\frac{92}{126}$ of the absolute hydrochloric acid consumed; or, $\frac{92}{90}$ of the dry oxalic acid ($H_2C_2O_4$) indicated.

The oxidation to permanganate must be at the ordinary temperature and in a very strongly alkaline liquid, otherwise

* Benedikt and Zsigmondy, 1885: Analyst, 10, 205; from Chem. Zeit.
Fox and Wanklyn, 1886: Chem. News, 53, 15: Jour. Chem. Soc., 50, 395.
O. Hehner, 1887: Analyst, 12, 44.

† Some operators oxidize by adding a 5 per cent. solution of the permanganate afterward boiling. Before boiling the color may be black or bluish purple, but if green, more permanganate should be added.

‡ $C_3H_5(OH)_3 + 4\,KMnO_4 = K_2C_2O_4 + 4\,MnO_2 + K_2CO_3 + 4\,H_2O$.

the oxidation may proceed to formation of carbonic acid, and the yield will be too light. The acidulation by acetic acid must be sufficient, otherwise calcium sulphite or even calcium carbonate may be formed, and the apparent yield will be too large. In adapting the process to fluid extracts, 5 cc. of the latter were evaporated, in a long-necked flask, at a little above alcohol-boiling point, until *all* the alcohol was expelled, when the alkali was added and the oxidation instituted as above described.

TRIAL OF METHOD I.—SEPARATION OF GLYCERIN BY SOLVENTS.

Of fluid extracts, 5 cc., with addition of known weights of glycerin, were treated as described above for method I.

Samples Taken.	Glycerin Added.	Glycerin Recovered.
1. Belladonna F. E.	0.5645 Gram.	0.500 Gram.
2. Wild Cherry "	0.8035 "	0.790 "
3. " " "	0.588 "	0.572 "
4. " " "	2.419 "	2.361 "
5. Uva Ursi "	0.3905 "	0.399 "
6. " " "	0.494 "	0.509 "
7. " " "	1.480 "	1.355 "
8. Water	0.2045 "	0.195 "

TRIAL OF METHOD II.—OXIDATION OF GLYCERIN TO OXALIC ACID.

Of fluid extracts, 5cc., with addition of known weights of glycerin, were treated as described above for method II., (titrating the oxalate with standard hydrochloric acid and alkali):

Samples Taken.	Glycerin Added.	Glycerin Found.
1. Belladonna F. E.	0.222 Gram.	0.229 Gram.
2. Uva Ursi "	0.261 "	0.260 "
3. Wild Cherry "	0.228 "	0.229 "

Some investigation was made to find whether or not oxalic acid could be formed from vegetable drugs by the oxidation process of method II.,—the action of permanganate in strongly alkaline solution at common temperatures. Also, whether these drugs would hinder the oxidation of glycerin or not. The following conclusions were reached: (1). Quinine reduces the permanganate but neither forms oxalic acid nor hinders its formation from glycerin. (2). The same is true of berberine.

(3). The same is true of hydrastine. (4). The same is true of emetine. (5). Oxalic acid is formed from belladonna fluid extract. (6). A trace of oxalic acid is formed from wild cherry fluid extract; also (7), from quassia fluid extract. (8). Oxalic acid is formed from uva ursi fluid extract; also (9), from juglans fluid extract. (10). The quantities of oxalic acid resulting in tests 5, 8 and 9, though more than the traces of tests 6 and 7, still are quantities so small as to come within the limits of error common in this estimation of glycerin.

Is Copper Present to an Injurious Extent in Extracts, Solid or Fluid?

D. P. SHULER, SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The following method was used for separation of the copper: The extract, to the amount of three to four grams, was taken in a porcelain crucible and heated until nearly incinerated, cooled, 10 to 15 drops of concentrated sulphuric were added, the whole heated until sulphuric vapors were given off, the mixture cooled, about 1 cc. water added and heated to boiling, when about 10 cc. more of water were added, and the solution filtered and washed until about 20 cc. of filtrate were obtained. The solution was then made neutral by adding, drop by drop, a concentrated solution of potassa, then acidulated by adding two or three drops of sulphuric acid, and tested for copper by a method of reduction, described by Cresti,* as follows: To the slightly acidulated solution, a small strip of platinum foil and a piece of granulated zinc were added (letting the platinum rest on the zinc), and allowed to remain for several hours. The platinum foil was then removed and exposed for a few seconds to the fumes of bromine and of hydrobromic acid, obtained by heating solid potassium bromide with concentrated sulphuric acid, when, if copper be present, a violet to purple color is observed, due to solution of the cupric bromide in hydrobromic acid.

* L. Cresti, 1877; Gazzetta Chim. Ital., 7, 220; Zeitsch. Anal. Chem., 16, 474; Jour. Chem. Soc., 32, 803.

Working with a known solution of copper sulphate, (0.001 gram. of the salt in each cc. of water), the test proved sensitive to 1 part of metallic copper per 100,000 parts of extract, under treatment by the above method. The extract used for the control analysis was solid extract of hyoseyamus, prepared by students in the pharmacy department, was made without contact with copper, and it alone gave no reaction for copper by this method.

The method of Dr. Squibb for detecting copper in extracts was tried, but as it required two to three days to separate the copper, it was given up.

I examined as many of the different makes of extracts as I could obtain, and obtained results as follows:

Extract of taraxacum,—Mf'g house of A.—gave a fair test for copper.
" gentian, " " " gave a fair test for copper.
" damiana, " " " gave a fair test for copper.
" cannabis indica " " " gave a decid'd deposit of copper
" buchu " " " showed presence of copper.
" digitalis " " " showed presence of copper.
" hyoseyamus " " " showed the presence of copper.
" belladonna—Mf'g house of B.—showed the presence of copper.
" cannabis indica" " " gave decided coat of copper.
" gentian —Mf'g house of C.—showed presence of copper.
" belladonna—Mf'g house of D.—showed the absence of copper.
podophyllum " " " showed presence of copper.
" aconite —Mf'g house of E.—showedpresence of copper.
" hops —Mf'g house of F.—gave decided coat of copper.
" nux vomica—For'n house of G.—showed absence of copper.
" ignati amara—Mf'g house of H.—showed absence of copper.
" taraxacum —Mf'g house of I.—showed absence of copper.
" conc. digitalin—Mf'g house of J—gave decided coat of copper..
" "Ergotine"—Foreign House —showed presence of copper.
Fluid extract cannabis—M'fg house of K—showed absence of copper.
Fld. ext. berberis aquif—Mf'g house of L.—showed a trace of copper.

No more fluid extracts were examined since those of the principal manufacturers are made without the use of heat, therefore with a very small chance to become contaminated with copper. One-half a fluid ounce was used in testing the fluid extracts. None of the extracts, except the two of Indian hemp, that of hop, and the "digitalis" concentration, gave coatings heavy enough to indicate more than one part of copper in from

50,000 to 100,000 of the extract. The two extracts of Indian hemp, that of hop, and the "digitalin" showed the copper coating on the foil. Of these, the Indian hemp of house A. gave the largest deposit, and this one I attempted to work quantitatively, but in that I was not able to obtain a quantitative result. Certainly it gave no more decided reaction for copper than was obtained from the known solution of one milligram of copper sulphate per cubic centimetre of solution.

The preparations that have a green color are more apt to contain copper, but the green color is no proof of its presence. And those containing oil or resin, such as hops and Indian hemp, are more apt to be contaminated with copper, owing to the splitting up and combination of the oil with the copper oxide of the vessels used in the evaporation of the extracts.

It is the conclusion of the writer that extracts, solid or fluid, do not contain copper to an injurious extent.

Query No. 17.

What is the Quality of Cinchona Bark as found in the Retail Drug Stores?

By Leroy A. Ellis, School of Pharmacy, University of Michigan.

The object of the work undertaken by the writer is to show the quality of cinchona bark as found in the average retail drug-store. Nineteen samples of the unground bark were obtained, including ten samples of red and nine of yellow bark. The samples were purchased in various retail stores in the State of Ohio. In preparation for the assay the samples were all reduced to a No. 30 powder. With a view of determining which assay process would give the best results, several preliminary assays were made, according to different methods, with a final selection of Prollius' method, which in brief is as follows:

Five gm. of the bark No. 30 powder is digested with 100 cc. of Prollius' fluid (which is a mixture of 325 cc. ether, 25 cc. alcohol, and 10 cc. stronger water of ammonia) for 24 hours, with frequent agitation. Fifty cc. of the clear ethereal solution is then decanted and acidulated with sulphuric acid of 5 per cent. strength which dissolves out the alkaloids as sulphates. The acidulated water solution is separated, and the alkaloids precipitated by stronger water of ammonia. The free alkaloids are then taken up by a mixture of three parts ether and one part of chloroform. After the separation of the supernatant layer of ether-chloroform it is evaporated to dryness, giving the total weight of alkaloids from 2.5 gm. of the bark. This method I modified as follows: The ether-chloroform solution, obtained after dissolving the alkaloids, was filtered through a little cotton. The object of filtering is to remove the albuminous substances that are most always present at this step of the process, and which, if not removed, will make the alkaloids dark colored.*

* This was proven by taking different portions of the same solution and evaporating some to dryness before filtering and some after. That which was evaporated after filtering was much whiter.

The loss that would naturally accompany the filtering of this solution is obviated by washing the cotton with some of the fresh ether-chloroform mixture, until the filtrate ceases to give a precipitate with Mayer's reagent.

Another modification might also be made. Instead of 100 cc. of Prollius' fluid, as directed in the original method, 80 cc. are sufficient to dissolve the alkaloids contained in 5 gm. of the bark. For by comparing any of the two assays of samples Nos. 8 to 19 inclusive, where 80 and 100 cc. were used it is seen that just as close results are obtained as in assays of samples Nos. 1 to 7 inclusive, where 100 cc. were used in each assay. Each of the 19 samples was assayed twice. The first modification was used in each assay, while the second modification was used in the first assay of each sample after the seventh, as can be seen in the following table, which also gives the place where each sample was obtained, and the per cent. of alkaloids :

NO.	KIND.	OBTAINED AT—	FIRST ASSAY.		SECOND ASSAY.		Av. Per Cents.
			cc. of Prollius' Fluid Used.	Per Cent. of Alkaloids.	cc. of Prollius' Fluid Used.	Per Cent. of Alkaloids.	
1	Red	Ottawa, Ohio	100	6.78 pr ct.	100	7.40 pr ct.	7.065
2	"	Columbus, "	100	9.16 "	100	8.88 "	9.02
3	"	" "	100	4.43 "	100	5.32 "	4.87
4	"	Toledo, "	100	7.81 "	100	8.04 "	7.92
5	"	" "	100	4.40 "	100	4.92 "	4.66
6	"	" "	100	6.02 "	100	6 34 "	6.18
7	"	Delaware, "	100	5.82 "	100	5.70 "	5.76
8	"	Columbus, "	80	8.84 "	100	8 66 "	8.75
9	"	Ottawa, "	80	4.96 "	100	5.16 "	5 06
10	"	Delaware, "	80	4.68 "	100	4.86 "	4.77
11	Yellow	" "	80	10.54 "	100	10 82 "	10.68
12	"	" "	80	4.06 "	100	4.34 "	4.20
13	"	Ottawa, "	80	4.18 "	100	4.30 "	4.24
14	"	Columbus, "	80	4.44 "	100	4.02 "	4.23
15	"	" "	80	1.22 "	100	.90 "	1.06
16	"	" "	80	4.58 "	100	5.02 "	4.80
17	"	Toledo, "	80	5.12 "	100	5.46 "	5.29
18	"	" "	80	7.28 "	100	6.68 "	6.98
19	"	" "	80	6.38 "	100	5.90 "	6.14

Average of red, 6.45 per cent.; average of yellow, 5.29 per cent.; average of all, 5.87 per cent

Analysis of Yerba Santa.

R. S. DUPONT, SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

In this analysis the leaves of the plant, in about No. 60 powder, were used. The scheme of analysis followed was that of H. B. Parsons, given in *Phar. Jour. Trans.*, [3] x. 793; *Am. Jour. Phar.*, lü. 210, and elsewhere.

The amount of moisture lost on drying was determined by taking a known weight of the drug (about two grams). and drying at 105° C. (221° F). This loss was found to be 6.73 per cent. of the weight of the drug. This loss represents water, and possibly a small amount of volatile oil.

The mineral matter was estimated by igniting a known weight of the drug in a porcelain crucible at a dull red heat. The ash left after igniting was 8.10 per cent. of the drug taken. The ash was then treated with several portions of warm water; the residue left, after treating the ash with water, was dried and weighed, and found to be 64.37 per cent. of the original weight of the ash; the 35.63 per cent. removed by the water being recognized as chloride, sulphate and carbonate of potassium.

The remaining ash was then exhausted with dilute hydrochloric acid, which removed 29.06 per cent. In this acid solution were found calcium phosphate and a trace of iron.

The residue was then thoroughly washed, dried, weighed and treated with a solution of sodium hydrate; this removed 12.64 per cent. of its weight; the substances dissolved being silicates of potassium, etc., the final insoluble residue consisting of sand, etc., adhering to the drug.

Ten grams of the drug were exhausted with chloroform by hot repercolation in a Soxhlet's tube, the process being continued for six hours. The chloroformic solution was then evaporated to dryness and weighed, and the residue found to be 20.11 per cent. of the weight of the drug taken.

This residue consisted of resin, coloring matter, etc. The drug left, after exhausting with chloroform, was then dried and weighed; this was placed in a Soxhlet's tube and extracted with alcohol, the process being continued for twelve hours. This alcoholic extract, consisting of resin, was evaporated to dryness and weighed, the yield being 11.43 per cent. of the weight of the drug left after exhausting with chloroform.

The remaining drug was dried and macerated with water for ten hours; the mixture was filtered, and a portion of the filtrate, on acidulating with hydrochloric acid, gave a gelatinous precipitate, indicating the presence of pectin or pectic acid.

The resins extracted by chloroform and alcohol respectively were then examined: the resin extracted by chloroform was soluble in potassium hydrate, and also in ammonium hydrate. These alkaline solutions, on the addition of an excess of water, were not precipitated, but on the addition of alcohol, the resin is precipitated; this resin, after washing with alcohol, was found to be soluble in water.

The resin extracted from the drug by alcohol, after exhausting with chloroform, was found to be insoluble in chloroform, thus showing the presence of two distinct resins. Both are soluble in alcohol, but one is soluble in chloroform and the other insoluble in chloroform.

The resin extracted by chloroform has a distinct green color, and the resin extracted by alcohol, a brown color.

Volunteer Paper.

Examination of Vaselin and Petrolatum.

By S. S. Hance, School of Pharmacy, University of Michigan.

In this work, samples have been tried by several saponification methods, and the melting and congealing points have been taken.

To obtain the melting point I used a small glass tube drawn out so that the inside was somewhat larger than a pin and then closed at one end. This tube, filled with the sample, was attached to a thermometer at the bulb. This apparatus was then inserted in cold water and the water gradually heated and the point at which the sample became liquid was noted.

For the congealing point, the temperature at which the paraffin became solid was observed, using the same apparatus as for the melting point.

Also a quantity of the article was melted in a beaker and allowed gradually to cool, meanwhile stirring with a thermometer, and noticing the temperature at which the mass became solid.

By these methods I found the melting point of all samples tested to be near 43° C., and the congealing point to be near 35° C.,—there not being over two or three degrees difference between the samples tested.

In the tests by saponification, both aqueous and alcoholic solutions of potassa and of soda were used. After carefully weighing a quantity of the sample I treated it with the alkali, separated, and on re-weighing no perceptible loss in weight was found in any of the samples. For these tests six samples were obtained, from local druggists, three under the name of Petrolatum, and three under the name of Vaseline. No difference was observed in comparing the samples with each other.

A few citations of useful articles on this subject in pharmaceutical literature, are here appended, with no attempt at a complete bibliography of the pharmaceutical application of these agents:

Brunton, 1881.—Paraffin, production of. Chemical News, 43, 285.

Coltellion, 1877.—Paraffin, use of, in distilling alcohol. Pharm. Rundschau, 12, 131; American Journal of Pharmacy, 49, 232.

Dulby, 1883.—Paraffins, specific gravity of. Journal of Chem. Society, 43, 388.

Girard, 1876.—Vaselin, uses of. Pharm. Journal and Transactions, 6, 624; Amer. Journal of Pharmacy, 48, 143.

Mehu, 1885.—Vaselin, solubility of mercuric iodidein, Amer. Journal of Pharmacy, 57, 612.

Miller, 1873.—Cosmolin and paraffin ointment. American Journal of Pharmacy, 45, 534; Pharmaceutical Journal and Transactions, 4, 581.

Miller, 1874.—Paraffin, cosmolin and vaselin. American Jour. of Pharmacy, 46, 1.

Miller, 1874.—Vaselin. American Jour. of Pharmacy, 46, 59; Pharmaceutical Journal and Transactions, 4, 690.

Miller, 1874.—Paraffin, manufacture of, in the U. S., Amer. Journal of Pharmacy, 46, 59.

Miller and Lemberger, 1875.—Cosmolin, a substitute for. American Jour. of Pharmacy, 47, 257.

McKay, 1881.—Vaselin as a basis of ointment of mercury. New Remedies, 10, 116.

Moss, 1876.—Vaselin named. Pharmaceutical Journal and Transactions, 6, 623; American Jour. of Pharmacy, 48, 143.

Naylor, 1876.—Cosmolin, composition of. Amer. Journal of Pharmacy, 48, 234.

Rice, 1881.—Petroleum Ointments, most desirable melting points of. Pharmaceutical Journal and Transactions, 12, 283.

Rice, 1881.—Paraffins, melting points of soft. Amer. Jour. of Pharmacy, 53, 588.

Sheppard, 1882.—Petroleum ointments, melting points of. New Remedies, 11, 130.

Sheppard, 1882.—Vaselin. New Remedies, 21, 272.

Sheppard, 1881.—Vaselin and petroleum products. New Remedies. 10, 105.

Smith, 1886.—Paraffin as excipient. Amer. Journal Phar. 58, 337.

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1872.—German vaselin. Journal of the Society of Chemical Industries, 1, 97.

1874.—Paraffin Industry. Pharmaceutical Journal and Transactions, 4, 762.

1878.—Vaselin in toilet articles. New Remedies, 7, 185.

1879.—Vaselin in Pharmacy. New Remedies, 8, 9.

1879.—Vaselin a solvent of iodine. New Remedies, 8, 180.

1881.—Petrolatum of the U. S. P. American Journal of Pharmacy, 53, 256.

1881.—Vaselin syonyms. Phar. Journal and Transactions, 11, 695.

1882.—Solid paraffins. New Remedies, 11, 198.

1886.—Poisoning by vaselin. Weekly Medical Review, May 8th; Vaselin. Arch. Pharm., [3] 16, 45; Journal Chem. Society, 38, Abs. 93.

Pharmaceutical Literature—Its Character and Growth.*

By George McDonald, Kalamazoo.

The subject given me is one that is very broad and far reaching in its scope. Its history carries us far back down the centuries that have gone. Indeed, if we go back to the time of Chiron the Centaur, and his pupil Esculapius, who afterwards became the god of medicine, we find ourselves lost in the mazes of mythology and tradition. I do not know whether our worthy toast master intended that I should delve into the musty records of the ancient past, but I have thought it might be well for us to go back as far as we may, and take a rapid retrospective glance at the crude and inauspicious beginnings, which constitute the foundation stones, on which have been reared the noble structure of modern Pharmacy.

Pharmacy is defined by Webster, as "the art of preparing, preserving and compounding substances for the purposes of medicine." Accepting this definition as correct, the literature of pharmacy embraces not only the literature pertaining to the simple compounding of medicines, but also that of chemistry, so far as it applies to the preparation or isolation of substances used in medicine; and also that of botany, so far as it is descriptive of medicinal plants. In fact, were it not for the proverbial modesty of pharmacists, we might go further and claim that every known science, theology and law not excepted, are embraced in that of pharmacy.

Since Adam's fall, in which, according to the theologians, "we sinned all," we know that mankind, and womankind too, have been more or less subject to aches and pains, and manifold forms of disease. I presume that since that time there has been quite as much danger of an attack of colic from an unrestricted diet of "green apples," as there ever was before.

* Response to toast offered at the banquet Wednesday evening, July 12.

It seems self-evident that one of the earliest and most pressing needs of humanity was a knowledge of remedies with which to combat pain and disease; and as remedies had to undergo preparation of *some* kind before they were administered, it follows that the art of pharmacy must have preceded that of medicine. In truth, in the earlier history of our race, and even up to a period not so very remote, pharmacy and medicine were "twin sisters," and pharmaceutical literature in its beginnings was so closely interwoven with medical, chemical and astrological lore, and absurd and fantastic superstitions, that it is next to impossible to speak of one without the other. In the earliest ages, as is now the case with our own aborigines, and with savage tribes in other lands, pharmacy and medicine, together with the little literature appertaining to them, such as it was, was entirely in the hands of the priesthood. The earliest piece of pharmaceutical literature is what is known as the "Papyrus of Ebers." This is a collection of written formulas for the preparation of medicines, which was used by the Egyptian priesthood, and dates back, as nearly as can be ascertained, to the 16th century, B. C., or about the time of the Exodus of the Hebrews. This papyrus may be regarded as the first pharmacopœia of which we have any knowledge. It is, of course, quite unlike the more pretentious ones of to-day, but is, to all intents and purposes, a pharmacopœia.

The word "Apothecary," or the word so translated, occurs first in the 30th chapter of the Book of Exodus; it is there used in reference to the preparation of an anointing oil or ointment, and a perfume used by the Jewish priesthood in their ministrations. The "oil" is mentioned as an "ointment compound after the art of the apothecary," and the perfume as a "confection after the art of the apothecary."

Pharmacy seems to have been first recognized as a separate branch of study towards the beginning of the 4th century, B. C., when we find that it was made a distinct branch of medical study in the school of Alexandria in Egypt. This would be about the time of Hippocrates, the father of medicine, who, like all physicians at that time, was of necessity a pharmacist as well. It is a singular fact that through all the changes of time,

and vicissitudes of conflicting theories, quite a number of the remedies used by Hippocrates, occupy a prominent place in the Materia Medica of to-day.

The Materia Medica of pharmacy in the earlier ages, consisted largely of remedies of vegetable origin. Thus we find it stated in the Bible, that "the leaves shall be for the healing of the nations." This naturally resulted in a closer investigation of the characteristics of vegetable life, and may be regarded as the beginning of the study of botany, one of the sciences so closely related to pharmacy as to be, in fact, an integral part of it. Thus we find that in the early part of the 1st century, Dioscorides of the school of Alexandria, traveled through Asia Minor, Greece and Italy, and described and named more than 5,000 plants. Dioscorides is the first *great* teacher of pharmacy of whom we have any record, for although pharmacy had already been taught as a separate branch of medical study for over 400 years, it was not until his time, that investigations in pharmacy were pursued with any degree of system. He is also said to have been the first writer who exposed frauds in the preparation of medicines.

Following Dioscorides, the next great name is Galen, who was a graduate of the school of Alexandria, and flourished during the latter part of the 2nd century. His theory was that the properties of all medicines are derived from what he calls their elementary or cardinal qualities, viz.: heat, cold, moisture and dryness. Each of these qualities was again subdivided into four degrees; and a medicine, according to his notion, is hot or cold in the 1st, 2d, 3rd or 4th gradation. If the disease be hot or cold in any of these four degrees, a medicine possessed of a contrary quality, and in the same proportionate degree of elementary heat or cold, must be prescribed. This is emphatically the doctrine of opposites. Absurd and fantastic as these theories may appear in the light of to-day, some idea of the hold they had on the medical minds may be formed from the fact that they swayed the schools for over thirteen centuries. We find a key to Galen's method of physic embodied in Nicholas Culpepper's translation of the Dispensatory of the London College of Physicians,

printed in 1651. According to Galen, opium was cold in the fourth degree, and therefore required some correspondingly hot medicine to moderate its frigidity. This theory seems to be still applied in the confection of opium of the U. S. P. of 1870. The name of Galen comes down to us in pharmaceutical literature, where it will probably live for many years to come, in the word "galenical."

Pharmacy and Materia Medica, the first essentials of practical medicine, led not only to the study of botany, but almost simultaneously to that of chemistry. The first students of chemistry we have are the alchemists—those men who, in pursuit of the "ignes fatui" of the Elixir of Life, the Philosopher's Stone, and the transmutation of the base metals into gold, developed facts, and prepared the field for the stupendous achievements made by chemistry proper in the last two centuries.

Alchemy, the parent of chemistry, was the offspring of astrology, and up to the third century was so closely identified with religion that it may be regarded as a part of it. During the third and fourth centuries, however, it began an independent existence. The earliest alchemist of whom we have any record, was Geber, a Greek by birth, but who afterwards became an Arabian prince. He lived towards the close of the eighth century. He was acquainted with the the process of distillation. He also made Corrosive Sublimate, and Red Precipitate, and prepared Precipitated Sulphur after a method strictly analagous with that in use to-day. These are merely a few out of the number of chemical preparations with which he was acquainted. According to Dr. Johnson, his name has come down to us and become a part of our language, in the word "gibberish" (geberish), supposed to be derived from the obscurely figurative and metaphorical character of the language used by him to describe, or rather, to veil his alchemistic processes. As a sample of his style of expressions, he says: "Bring me the six lepers that I may cleanse them," by which he means the conversion of the six metals, Silver, Mercury, Copper, Iron, Tin and Lead, the only ones then known, into Gold.

From the middle of the eighth to the middle of the thirteenth Century, A. D., the Caliphate of Bagdad, in the east, and Cordova, in the west, were the great centres of learning, and during that period we are indebted to the Arabs for a more full development of Pharmacy. They were the fathers of chemical pharmacy, and to them are due the first prescriptions recording the preparation and mixture of different remedial agents. The first public apothecary shop of which there is any record was founded in Bagdad by the Caliph Almansor in 754 A. D., and the Arabian apothecaries of the twelfth century were under the direction of the government, and subject to strict supervision in regard to the quality and price of medicines. A Pharmacopœia published by Abul Hassan was their standard of authority. In this century we have the first mention of Alcohol by an Arabian physician named Abulcesis. It is interesting to know that in these early days physicians were not permitted to have any share of gains with apothecaries, nor to merchandise with them as to prices, and were required to inform the authorities whenever an apothecary falsified a drug.

From the first to the eighteenth century there are many noted names, more or less associated with pharmaceutical literature, but we can only mention a few, and those in a very casual manner. In the first century we have Celsus, a noted physician, and man of great learning; also, Menecrates II, who is credited with the discovery of Diachylon, or lead Plaster; Rhazes and Avicenna in the eleventh century, who were the first to introduce pharmaceutical preparations into their works, or made any improvement in the mode of conducting pharmaceutical processes; Roger Bacon, a Franciscan Monk, in the thirteenth century, who laid the foundations of chemical science in Europe, and whose discoveries were regarded as so extraordinary that he was excommunicated by the Pope, and imprisoned ten years for supposed dealings with the devil. Arnoldus de Villa Nova, also of the thirteenth century, who is accredited with being the first to introduce *Tinctures* into medical practice. Basil Valentine, a Benedictine Monk, about the fifteenth century, who was the first to introduce Antimony into medicine, and who, if report be true, killed several of his brother monks in

experimenting on them with the new medicine, hence the name of the metal—Antimoine (anti-monk.) He was also the first to discover Ammonia, and the mode of its preparation from Sal Ammoniac. He also noted the production of Ether from Alcohol. In the sixteenth century we have that remarkable man and prince of empirics, Paracelsus, oi as he termed himself, "Phillippus, Theophrastus, Bombastus, Paracelsus de Hohenheim," a man who produced a greater revolution in Materia Medica by the introduction of *chemical* remedies for internal use into medical practice, than any who had preceded him. Armed with Mercury, Antimony, Lead and Opium, remedies that are regarded as of no mean potency to-day, he set out to conquer disease in all its forms. He was elected professor of chemistry in Basel in 1527. This was the first chair of professorship of chemistry established in Europe. In the seventeenth century we have Van Helmont, a man of irrepressible zeal and indefatigable industry, who spent fifty years of his life in torturing, by every chemical experiment he could devise, almost everything in the animal, vegetable and mineral kingdoms. In this century, we also have Glauber, the discoverer of hydrochloric acid, whose name comes down to posterity in Glauber Salts. We also have Riverius, the author of that curious compend, "the Universal Body of Physic," and that serious joker, Nicholas Culpepper, general student in Physic and Astrology, and translator of the Dispensatory of the London College of Physicians. Subsequently the names connected with the literature of Pharmacy became so numerous that it would be useless to attempt to give them separate mention.

The term *Pharmacopœia* first appears as a distinct title in a work published at Basel in 1561 by Dr. A. Foes, but does not appear to have come into general use until the beginning of the seventeenth century.

The first work really worthy to be called a Pharmacopœia was published at Nuremburg, under the sanction of its Senate, in the year 1542. For this we are indebted to Valerius Cordus, a young student, who, during a transient visit at that place, accidentally produced a collection of medical recipes which he had selected from the works of the most esteemed writers, and with

which the physicians of Nuremburg were so highly pleased that they urged him to print it for the benefit of the apothecaries. To this casual circumstance we owe the introduction of Pharmacopœias.

Prior to this time the works principally used by apothecaries were the "Treatises on Simples," by Avicenna and Serapion; the "De Synonymis," of Simon Januensis, the "Antidotarius" of Nicolaus de Salernus, containing galenical compounds alphabetically arranged, and the "Liber Servatoris" of Bulchazim ben Aberazerim, consisting of preparations made from plants, animals and minerals.

Other European cities from time to time followed in the wake of Nuremburg. The London College was among the last to frame a standard code of medicines. The first Dispensatory of the London College of Physicians was published in 1618; other editions followed in the years 1650, 1677, 1721, 1746, 1787 and 1809. The Edinburgh Dispensatory was first published in 1699, and that of Dublin in 1807. In the edition of the London Dispensatory of 1721 a number of ridiculous remedies were omitted. The edition of 1746 was subjected to a still further expurgation, and in that of 1788 all of the extremely compound medicines that had been in use for centuries were omitted.

The first Pharmacopœia published in the United States was printed in Philadelphia in 1778. It was a small work of thirty-two pages, entirely in Latin, and comprising one hundred different preparations. It was printed for the use of the military hospital belonging to the army of the United States. Its author was Wm. Brown, M. D. The first authorized edition of the U. S. P. was issued in 1820.

To form a fair idea of the crude and embryotic conditions of pharmaceutical literature in even the seventeenth century it may be well to take a rapid glance through some of the pharmacopœias of that period. The first one we will look into is the third edition of a work entitled "A Physical Directory, or a Translation of the Dispensatory made by the Coledge of Physitians of London, and by them imposed upon all the Apothecaries

of England to make up their medicines by, by Nich. Culpepper, Genl. Student in Physick and Astrologie," published in 1651. He informs us that "this Dispensatory is borrowed in great part from Arabia, part from Greece, some from France and some from Italy." Prior to the time of Culpepper the Dispensatory had always been published in Latin, so that it was a sealed book to all but the learned—a practice which was continued until so recent a period as 1864, when the British Pharmacopœia was first published in English. In his "Epistle Dedicatory" the translator soundly berates the college for their action in this regard. He asks: "How will you answer for the lives of those poor people that have been lost by your absconding Physik from them in their Mother Tongue?" His "catalogue of the simples conducing to the Dispensatory," or what we would call the primary list, is classified as follows: Roots, Barks, Woods and their chips and raspings, Herbs and their leaves, Flowers, Fruits and their buds, Seeds and Grains, Tears, Liquors and Rozins, Juyces, Things bred of plants, Living Creatures, Parts of Living Creatures and Excrements, Belonging to the Sea, Metals, Minerals and Stones. Among the Living Creatures are Millipedes, Vipers, Land Scorpions, Eels, Oysters and Grasshoppers. It is well to note the use to which Eels were put. There is probably quite as much used for such a remedy to-day as then. He says:" Eels being put into wine or beer and suffered to die in it, he that drinks it will never endure that sort of liquor again." Among "parts of living creatures and excrements" are "the head of a cole black cat," "the liver of a frog," "unicorn's horn," "the skull of a man that was never buried," and milk. Of milk he says: "Milk is an extream windy meat, therefore I am of the opinion of Dioscorides, that it is not profitable in headaches."

The compounds are classified as Compound Waters, Physical Wines, Physical Vinegars, Decoctions, Cyrups both simple and compound which are in use, Rob or Sapa and Juyces, Lohocohs, Preserves, Conserves and Sugars of Herbs, Leaves, Flowers and Fruits, Spices or Powders, Electuaries, Pills, Troches, Simple Oyls made by expression, Compound Oyls, Oyntments, Plaisters and Cerecloaths, Chymical preparations more used,

Extracts, Salts of any kinds of vegeitables, and concluding with "preparations of certain medicines very necessary for apothecaries."

Robs or Sapa and Lohocohs or Lohochs are preparations unknown to the average pharmacist of to-day. I will give you, in his own words, what Nicholas Culpepper has to say of them. Of Robs he says: "Rob is something of an uncouth word, and happily formidable to the ignorant countryman in these thieving times; and therefore, in the first place, I will explain the word. Rob or Sapa is the juyces of a fruit, made thick by the heat, either of the sun or of the fire, that it is capable of being kept safe from putrifaction. Its use was first invented for diseases in the mouth (however, or for whatsoever it is used now, it matters not). It may be kept about a year, little more or less."

Of Lohochs he says: "Because this word is also understood by but few, we will first explain what it is. The word Lohoch is an Arabian word, called in Latin 'Linctus,' and signifies a thing to be lick'd up. It is in respect of body something thicker than a cyrup and not so thick as an Electuary. The use it was invented for was against the roughness of the wind-pipe, diseases and inflammation of the lungues, difficulty of breathing, cold, coughs, etc. Its manner of reception is with a Liquoris Stick, bruised at end, to take up some and retain it in the mouth till it melt of its own accord."

Among the Oyls is found "Oyl of Earthworms," which is directed to be made as follows: "Take of Earthworms half a pound, wash them well in wine; then add Oyl of Olives two pound, Wine eight ounces; boyl them in a double vessel to the consumption of the wine." He also gives explicit directions for the manufacture of "Oyl of Bricks" and "Oyl of Swallows." Of "plaisters," he says: "I hope nobody is so simple as to eat plaisters. The general way then of application is to the grieved place."

Electuaries take up quite a space, and among them are to be found those hydra-headed monsters of polypharmacy known as Confection of Damocrites, consisting of about sixty ingredients; the Treacle of Andromachus, containing over seventy ingredients, and the Great Antidote of Mathiolus against Poyson and

Pestilence, containing over two hundred ingredients, embracing the animal, vegetable and mineral kingdoms. Among preparations very necessary for apothecaries, we find the way to make "Oesipus," which appears to be the prototype of the much vaunted new preparation "Lanolin;" also the way to burn "River Crabs" and the way to prepare "wood lice" and other curious things.

"The Royal Pharmacopœia Galenical and Chymical, according to the Practice of the most Eminent and Learned Physitians of France and published with their several approbations, faithfully Englished by Moses Charras, the King's Chief Operator in his Royal Garden of Plants," published in 1678, twenty-seven years after Culpepper's translation of the London Dispensatory, is even more crude and quaint than that work. We here find water, rain, snow, ice, hail and thunderbolts classed as metals. We can perhaps understand why "thunderbolts" should be placed in this category, as "bolts" of any kind are suggestive of a metallic origin; but why the others should have been so classed is quite beyond our comprehension. We also learn by this work that the national characteristics of the Frenchman and the Englishman were quite as strongly marked then as now. Thus, while the sturdy and matter-of-fact Englishman was satisfied with plain "vipers," the lively and volatile Frenchman wants "*live* vipers, large, fat, and vigorous." We also find here a very lucid explanation of the difference between "Poyson and Medicament." A Medicament is anything that is capable to change our nature for the better. "Poyson differs from medicament in this: that it destroys our nature; but it may pass for medicament in regard that Pharmacy is able to correct and tame whatever it has of wild and mischievous, and render it wholesome."

In the early part of the present century, there was a work published in London called "A Supplement to Pharmacology." The name of its author I have forgotten. This work contained about everything, simple and compound then known, in the animal, vegetable, and mineral kingdoms, and besides describing their properties and mode of manufacture, also gave their price by the ounce, pound, and in the case of some articles, by the hundredweight. A considerable space was taken up by a class

of preparations described as "Reductions;" in other words, "Adulterations." We derive from this the pleasing assurance that the world has not gone backward, and that the stock of integrity possessed by our pharmaceutical brethren of former generations was in no respect superior to our own.

Up to this time Medicine and Pharmacy were correlative branches of study, the latter subordinate to the former. From this time began the struggle which, at last, culminated in the emancipation of Pharmacy from co-education with and subordination to medicine. And the establishment of the Philadelphia College of Pharmacy in 1821 may be regarded as about the period at which Pharmacy emerged from her swaddling clothes and asserted her existence as an independent entity.

The establishment of the Philadelphia College greatly stimulated the desire for a higher pharmaceutical knowledge, and was soon followed by others: that of New York in 1831, Baltimore in 1855, Chicago in 1864, Boston in 1867, and Ann Arbor in 1868, and a number of others since. In 1885 there was established in Chicago what is known as the "National Institute of Pharmacy," which, by its admirable method of giving instruction by mail, has proved such a boon to the large number who, through force of circumstances, are unable to avail themselves of the advantages resulting from attending a course of study at the regular colleges.

The first periodical published in this country devoted to the interests of Pharmacy was, I believe, the American Journal of Pharmacy, first published in 1825, under the auspices of the Philadelphia College of Pharmacy. It was for many years published as a bi-monthly, and for over a quarter of a century seemed to amply fill the demand for a journal of that character. Its pages have always been largely devoted to articles of original research, and the best contributions to the literature of Pharmacy in this country have first seen the light in its pages. Following it in 1857, came the Druggists' Circular, a journal which, by its better adaptation to the practical wants of the mass of druggists of the country, secured a circulation which its more conservative and scholarly predecessor has never been able to attain. Subsequently, numerous pharmaceutical journals

came into the field at frequent intervals as aspirants for public favor, until to-day, scarcely a year passes in which one or more new ones do not make their debut. In accordance with the law of natural selection, the fittest survive—while the weaker ones either fall by the wayside or are absorbed by their more vigorous cotemporaries. This rapid increase in the growth of the journalism of Pharmacy must be regarded as the exponent of the increase in investigations in Pharmaceutical science. The field for research is practically unlimited, and as the investigators increase in number, they require new outlets for giving to the world the results of their experiments. The wonderful growth and improvement in the character of pharmaceutical literature during the last fifty years, can best be appreciated by an examination of the contents of the periodicals devoted to it during that period, through the "Reports on the Progress of Pharmacy" which have been for many years so valuable a feature of the annual publication of the "Proceedings of the American Pharmaceutical Association," and through other reports of a similar character published in other countries. So vast has it become that in many instances the compilers of these reports find it impossible to give abstracts, and have to confine themselves to merely classifying and indexing it, for the simple purpose of facilitating researches. Some idea of the magnitude may be formed by an examination of the "Index Pharmaceuticus" recently compiled and published by Dr. A. B. Lyons in the "Pharmaceutical Era," a journal which, although one of the latest candidates for favor, is by no means the least. The literature of Pharmacy to-day is not only voluminous, but valuable; valuable not to Pharmacy alone, but to other sciences and industries as well. We find that the crude notions, absurd conceits and false theories of other days are passing away, and in their place is being built up a *true* science, on the only correct basis, that of demonstrated facts and scientific induction.

There are numberless investigators at work every day, some of them living on a crumb in an attic, trying to extort from nature the secret of her methods, and the day may not be far distant when the literature of pharmacy will inform us that quinine and morphine have been produced from coal tar.

The universality of the growth of pharmaceutical literature, is well exemplified in the fact that since 1881 there has been on foot an effort which has already made considerable headway, for the production of an international pharmacopœia, to serve as a common standard of authority for the leading nations of the world.

As a fitting exponent of the exalted condition of the literature of pharmacy to-day, as compared with that of the past, we may be permitted to point with pride to the U. S. P. of 1880, a work which although it may have its faults, and whose methods may not be acceptable to all, stands in its general character and scope far in advance of anything that has preceded it. The pharmacists of the U. S. A., the youngest child in the family of nations, have to-day the proud distinction of possessing as their standard of authority, a compendium of pharmaceutical literature which, if not superior to, is at least the peer of any authorized standard of any country.

Let us hope that with our colleges of pharmacy, our national and state associations, and the journals devoted to our literature, the condition of pharmacy to-day is but a faint promise of a more glorious future—the rose-tinted dawn, prophetic of the bright effulgence of the noonday sun.

Volunteer Paper.

Note on the U. S. P. Method of Assaying Opium.

A. B. Lyons, M. D.

In the U. S. P. process for assaying opium, seven grams of the drug are treated with 70 cc. of water and 3 grams of lime, and of the filtered fluid 50 cc. are taken to represent 5 grams of drug. In the original assay process of Portes and Langlois, the directions were to take 53 cc. of the filtrate as the equivalent of 5 grams of opium. T. J. Wrampelmeier and G. Meinert, in a paper read before our Association at its last meeting, detail some experiments by which they endeavored to decide whether the directions of the U. S. P. were in fault, especially in view of the statement of Mr. Conroy, of Liverpool, England, that 52 cc. was the correct equivalent quantity. These authors report having

made two experiments in which they arrived at the total volume of fluid by a somewhat complicated process, drying the entire residue, noting its loss in weight, and adding this to the amount of the total filtrate. They found that the specific gravity of the filtered fluid was about 1.0127. Had they evaporated an aliquot portion of this, and ascertained how much extractive it contained, they could have easily made their calculation from the data thus afforded.

Messrs. J. O. Braithwaite and E. H. Farr, of London, Eng., criticising the results reached by Wrampelmeier and Meinert, (*Am. Druggist*, Jan., p. 12,) adopt this simple mode of settling the question in dispute. They state that the opium yields 38 to 40 per cent. of extractive, so that the weight of the "aliquot portion" of filtrate taken for assay should be 50×1.9 (to 2.0); the volume of the solution will be, therefore, $51.9 \div$ sp. gr., (about 1.016) or about 51 cc. (In their experiments 51.11 cc.)

Mr. Conroy reiterates his former dictum, founded "on the well known fact that opium yields on an average 50 per cent. of solid extract, equal in consistence to good new opium," and that 2.5 grams of this extract, when dissolved in water, will increase the volume of the fluid by 2 cc., as he has ascertained empirically. His reasoning is faulty, in that it ignores the fact that *lime* is used in the extraction, modifying materially the yield of extractive, and that it takes no account of the water remaining in the "extract." He states that it is "quite impossible to expel the whole of the moisture from the marc at 100° C," and to this he attributes the "failure" of Wrampelmeier and Meinert to reach results coinciding with his own.

An examination of the method pursued by those gentlemen will show that the trouble did not arise wholly from this cause. They tell us that after draining the opium, weighing the fluid obtained, and taking its specific gravity, they dried the residue to constant weight, noted the loss in weight, multiplied this by the specific gravity of the fluid, and thus arrived at the weight of the fluid that had been held in the marc. They should have ascertained how much residue remained when a given quantity of the filtrate was evaporated to complete dryness, and have multiplied, not by the specific gravity of the fluid, but by the ratio of *volatile to total constituents*, quite a different factor.

Their result was, therefore, necessarily low, and their conclusions based thereon of course erroneous. It seems rather strange that they did not themselves question their figues from the very low percentage of extractive (hardly 25 per cent.) that they show from the opium. At my request, Mr. Frank A. Thompson has made a few experiments to endeavor to settle the point in dispute. His results coincide quite closely with those independently obtained by Braithwaite and Farr. After macerating the opium with ten times its weight of water, according to the directions of the U. S. P., he obtained a filtrate having a specific gravity of 1.017 to 1.019, (in different experiments). Of this filtrate, 10 cc. yield .354 to .360 gram of dry extractive. (Exact figures cannot be expected unless the fluid is dried where its lime can be all converted into carbonate.) An attempt was made to dry the marc to constant weight, but this was found to be nearly impracticable. It was necessary to pulverize the partially dried residue, and expose it a long time to heat, with a certainty that it would meanwhile absorb carbonic anhydride, unless the desiccation were conducted in an atmosphere free from that gas. Here then was another source of possible error in the results reported by Wrampelmeier–Meinert, although possibly the necessary precautions may have been taken to avoid it. (Of course the lime used was dried at 100° C. before weighing, or there would have been still another element of inaccuracy in the result.)

Mr. Thompson's conclusion was that the plan of drying the marc involved difficulties that were fatal to any useful results, while the more obvious method of deducing conclusions from the amount of solid matter held in solution in the filtrate, could not lead one far astray. If we can assume that the whole of the water used remains in a condition to act as a solvent, and that the portion held by the marc is just as rich in extractive and in morphine as that which passes the filter, and no richer, the figures he obtained warrant the following deductions: (1). That the opium yielded about 37 per cent. of extractive to the solvent. (2). That the measure of total fluid was about 71.3 cc. 71.28 to 71.37); and (3) that the assay process should direct to use very nearly 51 cc. (50.9 to 50.98) of the filtrate to represent 5 grams of opium.

Query No. 25.

What is the Best Place for the Prescription Stand.

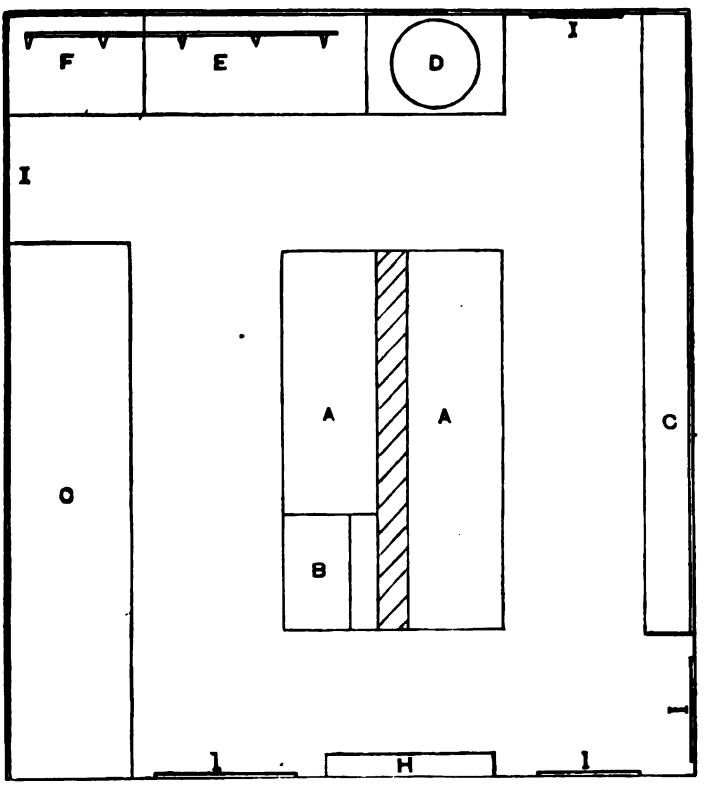
By A. B. Stevens, Ph. C., Ann Arbor.

In the arrangement of a drug store many things are to be considered. One of these things, and a most important one, demanding an early and careful consideration, is the prescription case—first, as to its location, and second, as to its arrangement.

Too often this important fixture is located in some out of the way place in the store (possibly in some ill-lighted corner), and compressed into its smallest possible dimensions that it may occupy as little room as possible.

In a store whose capacity of feet and inches is limited, the temptation to locate the prescription case as already mentioned is very great. To yield to this temptation is, however, a great mistake. The *very best* place in the store is not too good for the prescription case. No fixed rule can be given for the location and arrangement of this most important fixture, but we must bear in mind that it is at this desk that medicines are *dispensed*, medicines either beneficial or destructive to the health and life of our fellow creatures. Therefore the desk itself and everything pertaining to it should be arranged for the speedy and safe dispensing of medicines. The case should be so located that an abundance of light may be admitted. It should also be so located that it may be protected from the conversation of the store. This latter may often be accomplished by placing a counter between the prescription case and that part of the store occupied by customers. Better still, locate the prescription case in a room separate from but conveniently adjoining the general store. The dispenser is thus entirely protected from the conversation and questions of customers, and his mind is not diverted from the work of dispensing, a work which demands his careful and undivided attention.

The following may be found a very convenient arrangement where room will permit, and may be changed in shape or size to conform with rooms of other dimensions:



aa is the prescription case which should be made twice the ordinary width with upright shelves through the centre. The shelves should be open on both sides so that both sets of bottles may be used from either side of the case. For this purpose the bottles should be labeled on both sides. One side of the case may be furnished with graduates, vials, corks etc., convenient for making mixtures, liquids, prescriptions, etc. The other side may be furnished with convenient apparatus for making pills, powders and suppositories. At one end may be placed a writing desk *b* for writing labels, copying prescriptions, etc.; *c* is shelving; *d* is wash-bowl; *e* is a table to be used for manufacturing preparations requiring heat; *f* is a fume closet also connected with heating apparatus; *g* is a general work table; *h* is a poison closet; *iiii* are spaces which may be occupied by doors or windows.

Query No. 13.

An examination of the formulas of the several dispensatories, given as equivalents for those of the U. S. Pharmacopœia is desired.

Accepted by A. B. Lyons, M. D., Detroit, Mich.

The adoption in the U. S. Pharmacopœia of 1880 of the plan of expressing all formulas in parts by weight entailed upon the editors of the several dispensatories the onerous labor of recalculating into the familiar terms of pound, ounce, grain and pint, fluid ounce and minim the new formulas. This necessarily involved calculations sometimes of an intricate character, dealing with terms peculiarly confusing. That the new alternative formulas should be wholly beyond criticism in detail could not be hoped. A careful review of a large proportion of the formulas in which fluids play a part has given the writer profound respect for the thorough manner in which this difficult task has been performed for both the dispensatories, and has demonstrated in the great majority of cases the practical accuracy of the work in both.

Comparing the alternative formulas as a whole of the U. S. Dispensatory with those of the National, we note at once this difference: The latter are mathematically more exact, preserving generally very faithfully the ratios of the original formulas. In the former a broader treatment is adopted, slavish adherance to the logic of figures being regarded, perhaps justly, as of less consequence in a working formula than practical considerations of convenience. Nearly all the formulas of the U. S. Dispensatory yield such a quantity of product as most often meets the requirements of actual practice. In the case of tinctures, wines, syrups, etc., that quantity is almost uniformly two pints. The formulas for infusions yield generally one pint; in some cases we find the yield to be a fraction of a pint, but scarcely ever a fraction not easily calculated to the pint. In a number of the formulas the

product is said to be *about* one pint or two pints as the case may be, when it may vary an ounce or two from this—a latitude of expression that may sometimes lead to inconvenience, although it does not affect the accuracy of the formula, provided its instructions are faithfully followed.

In the formulas of the National Dispensatory it is the exception rather than the rule that the yield shall be one or two pints, or any simple fraction of a pint. This necessitates frequently calculations that are too intricate in the hands of the average drug clerk to be free from danger of serious error.

The formulas of the U. S. Dispensatory give the quantities of fluids by measure alone in most cases; those of the National give the quantities by weight, the measure being added as an equivalent, and in the case of acids, and some other fluids quite often omitted. Since the original formulas are intended to be used as they are, the secondary formulas, in which actual weights, not "parts," are given, ought by all means to include weights. Evidently the editors of the National have more faith in the ultimate adoption of the practice of weighing fluids than those of the U. S. In the dispensatory formulas weights are given in grains, avoirdupois ounces and occasionally avoirdupois pounds (the National several times speaking of "drachm" of 60 grains, a denomination belonging to a different system); measures are given in minims, fluid-drachms, fluid-ounces and pints.

Taking up the fluid preparations of the pharmacopœia in their sequence, we consider first the official vinegars. Of these there are but four. In each the proportion of drug to finished preparation is 10 per cent. by weight. The following table brings in comparison the formulas of the two dispensatories, together with others independently calculated, for vinegar of lobelia :

	Form'la by wgt.	Equivalent.	Calculated for Two Pints.	National Disp.		U. S. Disp.	
	Offic'l Pla by wgt.			As Given.	For Two Pints.	As Given.	For Two Pints.
Lobelia..	10	10 oz. av.	3.37 (=3⅜) oz. av.	1 oz. av.	3.46 oz. av.	1¼ oz. av	3½ oz. av
Dilute Acetic Acid,	5	4.76 fl. oz.	1.76 (=1¾) fl. oz.	½ oz. av.	1.73 oz. av.	1 fl. oz.	2 fl. oz
To make,	100	95 ± fl. oz	32 fl. oz.	10 oz. av. =9¼ fl. oz.	32 fl. oz.	16 fl. oz.	32 fl. oz.

The agreement between these is reasonably close, and for practical purposes they may be said to be identical. In the other formulas for vinegars the figures show an equally close correspondence, except in the case of the most important one of them all, and it is unnecessary to go into details of the comparison. The figures for the vinegar of opium merit closer study —they are as follows:

	Official Formula, parts by weight.	Equivalent.	Calculated for Two Pints.	National Disp.		U. S. Disp.	
				As Given.	For Two Pints.	As Given.	For Two Pints.
Opium.....	16	10 oz av	3.66 oz av, =3⅝ oz + 16 gr	1 oz av	3.83 oz av	2 oz av	3.55 oz av
Nutmeg. ...	3	3 oz av	1.10 oz av, =1 oz + 44 gr	131 gr	1.15 oz av	260 gr	1.05 oz av
Sugar.....	20	20 oz av	7.31 oz av, =7¼ oz + 26 gr	2 oz av	7.66 oz av	4 oz av	7.10 oz av
Dilute Acetic Acid.....	50	47.57 fl oz	17.42, =17⅜ fl oz	5 oz av	19.15 oz av	9 fl oz	16 fl oz
To make of Fluid.....	80	75.5 fl oz	27.6, =27⅝ fl oz	8 oz av, =7¾ fl oz	27.26 fl oz	1 pint	28.44 fl oz
Total.....	100	87.5 fl oz	32 fl oz	10 oz av	32 fl oz	18 fl oz	32 fl oz

It will be seen here that the National Dispensatory does not furnish all the data necessary for calculating a formula to yield just two pints, inasmuch as it does not give the volume of the product. The quantity of fluid before adding the sugar is given as 8 oz. av., or $7\frac{1}{8}$ fl. oz. Two ounces of sugar will add to this a volume of 1.222 fl. oz. about, giving the volume of product as 8.347 fluid ounces. I believe the figure $7\frac{1}{8}$ is in fact too small; $7\frac{1}{8}$ would be closer to the truth, and this would make the formula nearly identical with that arrived at in my own calculation. In the formula of the U. S. D., 9 fluid ounces of dilute acetic acid should be $9\frac{1}{8}$ fluid ounces, although the strength of the product is not materially affected by the use at this point of a scant allowance of menstruum.

In the formulas for dilute acids, the National Dispensatory is content, in most cases, with parts by weight, while the U. S. D. is not careful to secure a yield of one or two pints. The formulas of the latter are correctly calculated, but should be revised to render them, like the other formulas of this work,

convenient for use. The formulas for aromatic sulphuric acid both give, for 20 fluid ounces of product 8 minims of oil of cinnamon, a figure which proves to be a little scant, particularly if oil of Ceylon cinnamon is to be used. Nine minims would be nearer; or to make 32 fluid ounces of product, 14 minims. In the U. S. D. formula, the quantity of alcohol to be used is stated as 14 fluid ounces; it should be $16\frac{2}{3}$, or at least 16, but the product is not affected by the use of the smaller quantity.

The formulas for the official medicated waters, containing essential oils or stearoptenes, as given in the dispensatories, are essentially correct. Those of the National Disp. give the quantity of essential oil in grains, requiring the weighing of insignificant quantities of fluid. With suitable scales there is indeed no difficulty in doing this, and this method is much to be preferred on the score of precision. For the benefit, however, of those who from habit have come to regard fluids as unweighable, the equivalent in minims ought to be stated. In the formulas of the U. S. D. the specific gravity of the oil is not taken into account. Thirty minims of each is the quantity prescribed as equivalent to the "two parts" of the official formula. This is justifiable on the ground that in any case there is a large excess of the oil which remains undissolved. To preserve the proportion of the original formula, however, we should take of oil of anise 31+ minims, oil of cinnamon about $29\frac{1}{2}$ m., oil of fennel 32 m., oils of peppermint and spearmint nearly 34 m. The quantity of creosote called for by the formula would be about 145 minims instead of 140 m., as given in the U. S. D. In the official formula for chlorine water there is set down 75 parts of water, of which only 25 is actually used. Curiously enough the dispensatories both give the measure of the 75 as well as of the 25 parts, without commenting on the superfluity. In the formula of the National Disp. we are directed to take 360 grains *or six drachms* of hydrochloric acid. Of course this does not mean fluid drachms, but such an interpretation might easily be put upon the words.

The list of infusions is a short one, and the formulas are simple. In that for infusion cinchona both dispensatories give 72 minims as the quantity of aromatic sulphuric acid required

for a pint of the preparation, the National stating that this is the equivalent of 73 grains. If the specific gravity of aromatic sulphuric acid is correctly stated as .955, 73 grains will measure 80.5 minims. In the formula for infusion digitalis, the U. S. D. gives 6½ fluid drachms of alcohol when the quantity should be 6 drachms (strictly 5.85). In preparing the compound infusion of senna, the U. S. D. underestimates the effect of the large proportion of matter in solution on the specific gravity of the product, and the quantities of the various active constituents are therefore stated about 10 per cent. too low. The proportions of the various constituents required to make eight fluid ounces of the infusion should be senna 240+ grains, manna, magnes., sulph., of each 480+ grains, fennel feed 80+ grains, boiling water 9 fluid ounces, and these are very nearly the quantities given by the National.

Many of the working formulas for the official *liniments* are given even in the U. S. Disp. in parts by weight, without any attempt to state them in terms of volume. In the formula for Lin. cantharides, 1 ounce av. is about 8 per cent. too little for the cantharides (U. S. D). The quantity should be 1 oz. av. + 35 grains, or to make two pints 4 5-16 oz. av. The proportions in the next formula, that for chloroform liniment, should be nearly, chloroform 4½ fluid ounces, soap liniment, 11½ fluid ounces, instead of 4 and 11 as stated in U. S. D.; the yield 5 oz. av. in the formula of the National will certainly measure more than 4 fluid ounces, nearer 4 9-16. In the formula for liniment of soap the National Dispensatory gives 5 pints as the equivalent of 80 oz. av. of product; 5 1-3 would be nearer the truth. In the same formula 7 fluid drachms is given as the equivalent of 350 grains of oil of rosemary; the measure would be in fact about 6 13-16 fluid drachms, a difference greater than is generally tolerated in the formulas of this authority. With the exceptions noted the working formulas correspond fairly well with the official standard.

Working formulas for many of the official *solutions* present problems that can be satisfactorily solved only by the experimental method. In most cases the working formulas correspond pretty closely with those of the Pharmacopœia In the follow-

ing formulas of the U. S. D. literal faithfulness to the original would require the following changes, which are, however, of no importance: For Donovan's solution 1 fluid ounce of water, used to dissolve the iodides, should be 1 3-16 fl. oz.; for lime water, 3 and 16 fluid ounces should be respectively $2\frac{1}{8}$ and 13 fluid ounces; for solution of citrate of iron 20 fluid ounces of water should be 19, and $7\frac{1}{2}$ pints should be $7\frac{1}{4}$; for solution citrate of iron and quinine 6 fluid drachms of alcohol should be 5 1-3, and 4 fl. oz. of water should be $3\frac{7}{8}$; for solution of subacetate of lead, 20 fluid ounces of water should be $19\frac{1}{2}$; for solution of arsenite of potassium, 6 fluid drachms of water should be $6\frac{3}{8}$; for solution of citrate of potassium 11 fluid ounces of water should be $10\frac{1}{8}$; for solution of soda 10 fluid ounces should be $9\frac{1}{8}$; for solution of zinc chloride $4\frac{1}{8}$ fl. oz. of water should be $3\frac{3}{4}$. None of these changes are required except for the sake of making the formulas more exactly correspond with the originals; in some cases they may have perhaps been modified purposely as improvements on the official formulas, but there is no intimation given that such is the case. The discrepancies are due rather to a partiality to round numbers, which has a reasonable justification in their greater convenience, and in the ease of memorizing them. The following deviations from the official standard have an influence on the strength of the preparation: In the formula (U. S. D.) for solution chloride of iron $1\frac{3}{8}$ fluid ounces of nitric acid should be $1\frac{1}{4}$ fluid ounces; for solution of pepsin, 100 minims of hydrochloric acid should be 110 minims; for solution of potassa (1st formula) $2\frac{1}{2}$ oz. av. of potassium bi-carbonate should be 2 3-16 oz. av., and 1 oz. av. lime should be $1\frac{1}{8}$ (erring preferably here in the direction of excess, rather than of deficiency); for solution of soda (1st formula) 5 oz. av. of carbonate of sodium should be $4\frac{3}{4}$ oz., while $1\frac{1}{2}$ oz. lime should be $1\frac{5}{8}$ oz.; for solution arsenite of potassium 120 minims of comp. tincture of lavender should be 130 minims. All these, however, are to be considered rather as inaccuracies than as errors. In the formula for solution of chlorinated soda we find the first actual blunder. We are directed to dissolve the carbonate of sodium and chloride of lime each in $1\frac{1}{2}$ pints of water, the formula really requiring 6 pints. The yield, in this case, should be $14\frac{3}{8}$ pints instead of an even 14 pints.

Finally we observe that in the U.S.D. formulas for solution iron sub-sulphate, and for solution iron ter-sulphate no attempt is made to give volume parts, except for the water, although this is done in other similar formulas.

Among the formulas of the National for solutions, we note that the volume of the yield is sometimes not quite correctly stated. Thus, 50 oz. av. of liquor potassae is said to measure 47½ fluid ounces, instead of 46⅓; 50 oz. av. of liquor sodae is stated to be equal to 42 fluid ounces instead of 45⅓; 200 oz. av. of solution chlorinated soda is given as equal to 11 pints instead of 11⅓. The volume of the product is not given at all in the case of solution acetate of iron, solution citrate of iron, solution of pepsin, solution of acetate of lead, solution citrate of potassium and solution guttapercha. In the formula for solution citrate of iron and quinine, 13 "drachms" is given as the equivalent of 780 grains instead of 1¾ (1.783) oz. av. In the formula for solution of arsenite of potassium, 100 minims of comp. tincture of lavender should be 106 minims; in that for solution guttapercha 8 oz. av. should be, for accuracy, 7¾ oz., (7.77). There are two important errors: in the formula for solution of nitrate of mercury, the equivalent given for 9 oz. av. of nitric acid is three fluid ounces and 45 minims, instead of six fluid ounces and 41 minims; in that for solution of chloride of zinc, the quantity of nitric acid prescribed is ten times what it should be, 1,200 grains (2¾ oz. av. or 1⅞ fl. oz.) instead of 120 grains (89 minims).

Among the official mixtures, the following exceptions may be taken to the working formulas of the dispensatories. The National Dispensatory gives a yield too low (8 fl. oz. instead of about 8½ fl. oz.) the U. S. D. one that is too high, qualified, however, with an "about." There would be less danger in the latter case of error in compounding the mixture than in the former, since, in the latter, the fluids are all given in volume parts, which is not the case in the former.

The yield of the U. S. D. formula for chalk mixture takes no account of the solid ingredient; instead of 4 fl. oz. it should be 4⅚ fl. oz.; the quantity of compound chalk powder prescribed is too large, 480 grains instead of 456 grains.

The U. S. D. formula for compound licorice mixture will accord more nearly with that of the U. S. P. if for ½ fluid ounce of spirit nitrous ether we put 285 minims, and for 12 fluid ounces of water we put 11⅞.

The formulas of both dispensatories over-estimate the yield of mixture magnesia and asafetida. That of the National will produce about 14.8 fluid ounces instead of 15; that of the U. S. should be made up to about 15 fluid ounces instead of 16.

In the formula for compound mixture of licorice of the U. S., the distinctions of avoirdupois and fluid ounces, as well as those of differences in specific gravities in the several fluids, are conveniently ignored. To atone for this, we find, in the formula for mixture of rhubarb and soda, the equivalent of ½ oz. av. fluid extract rhubarb given as 3 fluid drachms, making the specific gravity of this extract about 1.28, while the equivalent of ½ oz. av. of spirit of peppermint is given as 5 fluid drachms, corresponding with a sp. gr. of 0.766; 216 and 280 minims respectively would have come much nearer the mark. Such variations would have a sensible influence on the activity as well as on the physical properties of the product.

The mixture of iron and ammonium acetate has proved a stumbling block for both the dispensatories. In the U. S. the quantity of tinct. chloride of iron should be about 82 minims instead of 90, and that of the water should be 4¼ fl. oz. instead of six; the formula, as it stands, condenses ten ounces, nearly, of fluid into eight. The National Dispensatory, in its formula, gives as the equivalent of 100 grains of tincture chloride of iron, 93 minims instead of 107, and for 150 grains of dilute acetic acid 150 minims instead of 157; for 500 grains of elixir of orange, 7 fluid drachms instead of one fluid ounce, for 750 grains of syrup, 70 fluid drachms instead of 10, making the sum of the several fluids, which should foot up, according to its own figures,* 10¼, only 9¼. Evidently the work on this formula escaped the careful revision that must have been given to others of no greater importance.

* Assuming the 70 fluid drachms to be an obvious misprint for 10.

Neither of the dispensatories hazards a guess at the volume of the product of the formulas given for mucilage of tragacanth. A similar reserve in the case of mucilage of acacia would have been discreet. From the figures given in the National, we deduce a specific gravity for this preparation of 1.26; from those of the U. S. D. of not less than 1.40. Neither of these guesses is very close, the specific gravity being in fact only about 1.135. With this exception, the working formulas given for the official mucilages will pass muster.

Comparatively few corrections of any importance are called for in the working formulas for the official *spirits*. In the U. S. D. formula for spirit ammonia aromatic, 2½ fluid drachms of oil of lemon should be 3 fluid drachms, and 22 fluid ounces of alcohol should be 24. In the formula for compound spirit of juniper, the quantities of the oils of caraway and fennel are so small that accuracy requires that the fractions of the minim be taken into account. The 20 minims of oil of juniper in the U. S. D. formula should be more nearly 24 minims. In the U. S. D. formulas for spirits of orange, lavender, lemon and nutmeg, the proportion of the volatile oil is considerably higher than it should be. In the formulas for spirits peppermint and spearmint, the quantity of crude drug prescribed, U. S. D., is 40 grains instead of 60 grains. The yield of the formula in the National for perfumed spirit is too low, 8½ pints instead of 8¾. The U. S. D. formula for spirit of myrcia needs generally reconstructing. The 40 minims of oil of orange peel should be 36 minims; the 25 minims of oil of pimento should be 29 minims; the 4⅛ pints of alcohol should be 5 pints; the 3⅛ pints of water about 3⅛ pints.

Formulas for *syrups* have given the editors of the dispensatories a good deal of trouble. The erroneous statement of the U. S. P., that the specific gravity of official "syrup" is 1.31 instead of about 1.32 has had a misleading influence, but the indispensible necessity for some experimental work which there was not time to make, no doubt had something to do with the unsatisfactory condition of some of the formulas.

The U. S. Dispensatory has been content to give the volume of the product in the majority of cases as "about" two pints;

if we realize in the outset the latitude allowed under this qualification, we shall find the formulas generally in other respects reasonably faithful translations of those of the Pharmacopœia. The actual volumes that will be obtained in following these formulas—to mention only the instances where the variation is important—will be: For syrup of garlic 34.8 fl. oz.; for syrup of althæa 36 fl. oz.; for syrup of almond 37 fl. oz.; for syrup of orange, lactophosphate of calcium, lemon, tar, senega, rhubarb and cherry bark, each 33.8 fl. oz.; for syrup orange flowers 35.2 fl. oz.; for syrup of lime 16.5 fl. oz.; for syrup of the hypophosphites and syrup sarsaparilla comp. 35.4 fl. oz.; for syrup of lactucarium 31 fl. oz.; for syrup of senna 39.4 fl. oz.

The following are the more considerable corrections which fidelity to the original would require: In the formula for syrup of citric acid, 3 fluid drachms of water should be $2\frac{3}{4}$; for syrup of almond $1\frac{1}{2}$ fl. oz. of water should be $1\frac{3}{8}$ and 15 fl. oz. of water should be $13\frac{3}{4}$; for syrup orange 3 fl. oz. of alcohol should be $2\frac{5}{8}$; for syrup lactophosphate of calcium 3 fl. oz. should be $3\frac{1}{8}$, and 3 pints of water should be $3\frac{1}{4}$ (at least), while 14 fl. oz. of fluid after concentration should be fifteen; for syrup iodide of iron 2 oz. of iodine is 43 grains too much, and 5 fl. oz. of water should be 4.5; for syrup hypophosphites 240 grs. of the hypophosphites of sodium and of potassium should be 247, and 50 minims of spirit of lemon should be 53; for syrup sarsaparilla co. $1\frac{1}{2}$ fl. oz. of guaiac wood should be $1\frac{5}{8}$ (strictly $1\frac{3}{8}$); for syrup of squill 16 fl. oz. of vinegar of squill should be $16\frac{1}{2}$; for compound syrup of squill 8 fl. oz. of alcohol should be 7; 24 fl. oz. of percolate should be 20; 8 fl. oz. of concentrated fluid should be 7, and 16 fl. oz. of filtered fluid should be $15\frac{1}{4}$. (This last correction is one of importance). For syrup of senna, 2 fl. oz. of alcohol should be $2\frac{5}{16}$, 8 minims oil of coriander should be $9\frac{1}{2}$ m., 5 pints of water should be $4\frac{1}{2}$.

Several important errors occur in the formulas of the National for syrups. In that for syrup of hydriodic acid, we find 60 oz. av. of water stated to be equivalent to $5\frac{3}{4}$ fluid ounces, while the quantity of water really required is not 6, but 4.8 oz. av., ($4\frac{5}{8}$ fl. oz.). The weight of the product in the

formula for syrup althæa is given as 20 oz. av. instead of 25. The volume of the product of formula for syrup almond is given as about 18 fluid ounces; it should be at least 19; 20 oz. av. of syrup of lime would be more than 16 fluid ounces; 45¼ oz. av. of syrup of hypophosphites would be about 34 fluid ounces instead of 32; 16 fluid ounces of syrup hypophosphites in the succeeding formula should be about 17 (it is noticeable that in this formula 22⅝ oz. of this syrup are made equivalent to 16 fluid ounces, while, just before, 22⅞ oz. av. were stated to have been about that measure).

In the formulas of the National Dispensatory for *tinctures*, the following inaccuracies occur: In the formula for tincture aloes and myrrh, 8¼ fluid ounces is given instead of 9⅜ fl. oz. as the equivalent of 8 oz. av. of alcohol; the yield should be about 11 fl. oz. instead of 10. In that for tincture conium, 9½ fluid drachms of dilute alcohol should be 11⅜, as the equivalent of 1⅜ oz. av. In the formula for tincture of opium, 19¾ fl. oz. of alcohol should be 18¾: in that for deodorized tincture of opium 9⅞ fl. oz. of alcohol should be 9⅜; in that for tincture rhubarb "3 oz. av. or 3½ fl. oz." of dilute alcohol should be "2½ oz. av. or 20¾ fluid drachms;" in that for tincture of serpentaria, 3⅜ fl. oz. of dilute alcohol should be 3½. In a number of instances the yield is not stated with sufficiently close approximation to accuracy, but the convenient qualifying adjective "about" indicates that the volume has been calculated roughly, rather than empirically determined. The same, however, is true of my own figures, which might sometimes require modification, perhaps to the extent of one or even two per cent., in the light of experimental observation.

The formulas of the U. S. Dispensatory make no pretension to fidelity to the original. In many instances the proportion of fluid used to moisten the drug is quite different from that prescribed, generally being proportionately smaller. The formulas interpret generally 10 per cent. of drug to mean 3 oz. av., 15 per cent. 5 oz., and 20 per cent. 5.5 or 6 oz. of drug to two pints without any nice calculation of the effect of variations in the specific gravity of the menstruum. The tabulated results of the examination made of these formulas bring out clearly the effect of

this method of dealing with them. We are brought back in effect to the old plan of a volume standard of strength, desirable every way in itself, but not in accordance with the pharmacopocial method. Prof. Remington, in a paper read before the Pennsylvania State Pharmaceutical Association at Philadelphia, argues in favor of restoring the volume standard for galenical preparations on the ground that fluids are invariably prescribed in this country by measure. The writer would have been opposed to the change which established weight standards, except for the sake of bringing our pharmacopœia into correspondence with those of continental Europe. Now that the change has been made it would be very unwise, in the writer's opinion, to go back to the old method, if for no other reason, because changes of any kind in standards are to be deprecated. Let the formulas remain as they are, but include in them volume parts as well as weight parts for fluids.

If equivalent volume parts are given, shall they be based on the ratio of litre to kilogram, or on that of fluid ounce to avoirdupois ounce, or of minim to grain? The question is one of considerable importance. At first view the first plan would probably commend itself to the majority of persons as most scientific, and, therefore, best. The object sought, however, is not a scientific, but eminently a practical one, viz.: to enable the ordinary druggist or drug clerk to use the formulas in the way in which he has been accustomed to work. The "parts" of the present formulas have for him a tantalizing vagueness. Express the quantities in grains and minims, or in ounces, avoirdupois and fluid, and he is at home. He can then easily calculate the formula to any required yield. The only question which would remain to decide would be whether the yield should be 1 oz., 16 oz., 32 oz, or 100 oz. In the tabulated statement accompanying, the writer has adopted the ounce as, on the whole, the most convenient unit, and has given, 1st, volume parts (fluid ounces) corresponding to the weight parts of the original formula taken as avoirdupois ounces, and 2d, has calculated each formula for a yield of 32 fluid ounces. The second of these formulas, or else formulas calculated to a yield of 100 fluid ounces, he would recommend for adoption in the U. S. Pharmacopœia of 1890.

The following will illustrate the form of the revised formulæ—differing somewhat from that proposed in a paper read at the last meeting of this Association:

TINCTURA LAVANDULAE COMPOSITA.

Oil of lavender, *eight parts*,	8.	(—8.63 fl. oz)	123 minims.
Oil of rosemary, *two parts*	2.	(—2.13 fl. oz.)	30½ minims.
Cinnamon in coarse powder, *eighteen parts*	18.	(—18 oz. av.)	283 grains.
Cloves, *four parts*	4.	(— 4 oz. av.)	52 grains.
Nutmeg, *ten parts*	10.	(—10 oz. av.)	130 grains.
Red Saunders, in coarse powder, *eight parts*	8.	(— 8 oz. av.)	104 grains.
Alcohol, *six hundred and eighty parts*,	680.	(—796 fl. oz.)	23$\frac{9}{16}$ fl. oz.
Water, *two hundred and seventy parts*	270.	(—259 fl. oz.)	7$\frac{11}{16}$ fl. oz.
Diluted alcohol, a sufficient quantity to make *one thousand parts*	1000.	(—1080 fl. oz.)	32 fl. oz.

In the tabulated statement, the writer has included in the formulas for tinctures also a statement of the quantity of fluid extract to be employed in case this is preferred to the crude drug. Thus, to make two pints of official tincture belladonna, we may use either 4.73 oz. av. of belladonna leaf, or 4.54 fluid ounces of fluid extract, assuming that this latter is of pharmacopœial strength. The tables will be of value if only to furnish these data, not found in any of the ordinary reference books.

There is little in the way of criticism to offer on the dispensatory formulas for the official wines. In the U. S. D. formula for wine of aloes, 26 fl. oz. of stronger white wine should be 29; for bitter wine of iron, 4 fl. oz. of tinct. sweet orange peel should be 5. With these exceptions the figures given are a reasonably close approximation to those of the U. S. P.

In conclusion, I desire to bring together the important corrections which should be made in the formulas of the dispensatories, and every one who has copies of those works, or either of them, should at once make the corrections indicated, in ink in the text, to avoid any possibility of error in attempting to use the formula.

Solution chlorinated soda, U. S. D.: the carbonate of sodium and chlorinated lime are to be dissolved each in 1½ pints of water; the quantity should be in each case 6 pints.

Solution nitrate of mercury, National: the equivalent of 9 oz. av. of nitric acid is given as 3 fl. oz. and 45 minims; it should be 6 fl. oz. and 41 minims.

Solution chloride of zinc, National: The nitric acid prescribed is ten times the correct amount, viz.: 1,200 grains=2½ oz. av.=1⅞ fl. oz. instead of 120 grains=89 minims.

Mixture of iron and ammonium acetate, National: 100 grains tincture chloride of iron=107 minims, not 93 minims as stated; 70 fluid drachms of syrup is a misprint for 10 fluid drachms.

Spirit of peppermint, U. S. D.: 40 grains peppermint should be 60; in the formula for spirit of spearmint, the same error is repeated.

Spirit myrcia, U. S. D.: Oil of orange 40 minims should be 36; oil of pimento 25 minims should be 29; alcohol 4½ pints should be 5; water 3⅛ pints should be 3⅛.

Syrup squill, U. S. D.: 15¼ fluid ounces of filtered fluid should be 16.

Syrup hydriodic acid, National: 60 oz. av. of water, should be 4.8 oz. av.=4⅝ fluid ounces.

Syrup althæa, National: The product is stated as 20 oz. av. instead of 25.

The following tabulated statement exhibits in full the results of the critical examination made by the writer of the formulas of the dispensatories, which are reduced, for comparison, to a uniform basis of a yield of 32 fluid ounces. The fifth column of the table gives the result of the writer's independent calculation.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces).	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Acetum Lobeliæ	Lobelia	10	10. av.	3.37 (=3⅜) av.	3.46 av.	3.5 av.
	Dilute Acetic Acid	5	4.76 fl.	1.76 (=1¾) fl.	1.78 av.	2. fl.
	Product	100	95 ± fl.	32. fl.	32. ± fl.	32. fl.
Acetum Opii	Opium	10	10. av.	3.66 (=3⅝) av.	3.66 av.	3.55 av.
	Nutmeg	3	3. av.	1.10 (1 av.+47 gr.)	1.095 av.	1.05 av.
	Sugar	20	20. av.	7.31 (=7 5-16) av.	7.31 av.	7.10 av.
	Dilute Acetic Acid	50	47.57 fl.	17.42 (=17⅜) fl.	18.3 av.	16. fl.
	To make percolate	80	75.5± fl.	27.6 (=27⅝) fl.	26. fl.	28.44 fl.
	Product	100	87.5± fl.	32 fl.	32. ± fl.	32. fl.
Acetum Sanguinariæ	Bloodroot	10	10. av.	3.37 (=3⅜) av.	3.46 av.	3.5 av.
	Dilute Acetic Acid	5	4.76 fl.	1.76 (=1¾) fl.	1.78 av.	2. fl.
	Product	100	95. ± fl.	32 fl	32. ± fl.	32. fl.
Acetum Scillæ	Squill	10	10. av.	3.37 (=3⅜) av.	3.46 av.	3.5 av.
	Dilute Acetic Acid	30	28.57 fl.	10.56 (=10 9-16) fl.	4.38 av	10. fl.
	Product	100	95. ± fl.	32. fl.	32. ± fl.	32. fl.
Acidum Aceticum Dilutum	Acetic Acid	17	15.58 fl.	5 24 (=5¼) fl.	5.24 fl.	5.22 fl.
	Distilled Water	82	79.68 fl.	26.78 (=26⅝) fl.	26.76 fl.	26.77 fl.
	Product	100	95.22 fl.	32. fl.	(32. fl.)	(32. fl.)
Acidum Hydrochloricum Dilutum	Hydrochloric Acid	6	4.97 fl.	9.14 (=9⅛) fl.	11.05 av.	9.03 fl.
	Distilled Water	13	12.48 fl.	22.96 (=23) fl.	23.92 av.	22.97 fl.
	Product	19	17.39 fl.	32. fl.	(32. fl.)	(32. fl.)
Acidum Nitricum Dilutum	Nitric Acid	1	0.676 fl.	3.35 (=3⅜) fl.	5.04 av.	3.43 fl.
	Distilled Water	6	5.76 fl.	29.04 (=29) fl.	30.25 av.	28.57 fl.
	Product	7	6.347 fl.	32. fl.	(32. fl.)	(32. fl.)
Acidum Nitro-hydrochloricum	Nitric Acid	4	2.705 fl.	5.71 (=5¾) fl.	8.53 av.	5.78 fl.
	Hydrochloric Acid	15	12.416 fl.	26.29 (=26¼) fl.	32.00 av.	26.23 fl.
	Product	19	15.+ fl.	32.+ fl.	(32. fl.)	(32. fl.)
Acidum Nitro-hydrochloricum Dilutum	Nitric Acid	4	2.705 fl.	0.982 (=1) fl.	1.455 av.	0.99fl.
	Hydrochloric Acid	15	12.416 fl.	4.508 (=4½) fl.	5 455 av.	4.48.
	Distilled Water	76	72.96 fl.	26.48 (=26½) fl.	26.55 fl.	26.52.
	Product	95	88.± fl.	32. fl.	(32. fl.)	(32. fl.)
Acidum Phosphoricum Dilutum	Phosphoric Acid	20	14.256 fl.	4.99 (=5) fl.	7.05 av.	5. fl.
	Distilled Water	80	76.8 fl.	27.06 (=27) fl.	28.20 av.	27. fl.
	Product.	100	90.84 fl.	32 fl.	(32. fl.)	32. fl.
Acidum Sulphuricum Dilutum	Sulphuric Acid	1	.5218 fl.	18.55 (=18 9-16) fl.	3.556 av.	1.86 fl.
	Distilled Water.	9	8.64 fl.	30.72 (=30¾) fl.	32 av.	30.69 fl.
	Product	10	9. fl.	32. fl.	(32. fl.)	(32. fl.)
Acidum Sulphuricum Aromaticum	Sulphuric Acid	200	104.36 fl.	3.32 (=3 7-16) fl.	(3.31 fl.)	3.2 fl.
	Tincture Ginger	45	50.3 fl.	1.6 (1⅝) fl.	1.59 fl.	1.67 fl.
	Oil Cinnamon	1	0.92 fl.	.029+ fl. (=14 m.)	12.7 m.	12.8 m.
	Alcohol	700	819. fl.	26.06 (=26) fl.	26.24 fl.	22.42 fl.
	Product	1000	1005.4.	32. fl.	32. fl.	32. fl.
Aqua Amygdalæ Amaræ	Oil Bitter Almonds	1	0.91 fl.	14 5 minims.	14¾ gr.	15. m.
	Distilled Water	999	959. fl.	31.97 fl.	32. fl.	32. fl.
	Product	1000	960. fl.	32. fl.	(32. ± fl.)	32. fl.
Aqua Anisi	Oil of Anise	2	1.956 fl.	31.3 minims.	29¼ gr.	30. m.
	Cotton	4	4. av.	58.3 grains.	58¾ gr.	60. gr.
	Water to make	1000	960. fl.	32. fl.	32. fl.	32. fl.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Work... Formu... U. S.
Aqua Camphoræ	Camphor	8	8. av.	116.7 grains.	117.3 gr.	116 gr.
	Alcohol	16	18.7 fl.	.623 (=⅝) fl.	.625 fl.	.5 fl.
	Cotton	16	16. av.	233 gr.	234.6 gr.	218.5 gr.
	Distilled water	1000	960. fl.	32. fl.	32. fl.	32. fl.
Aqua Chlori	Bl'k Ox. Manganese	10	10. av.	364. gr.	360 gr.	366 gr.
	Hydrochloric Acid	40	33.11 fl.	2.76 (=2¾) fl.	3. av.	2.86 fl.
	Water	25	24. fl.	2. fl.	2. fl.	1.9 fl.
		75	(72)		(6 fl)	(5.7 fl.)
	Distilled water	400	384. fl.	32. fl.	32. fl.	32. fl.
Aqua Cinnamoni	Oil Cinnamon	2	1.85 fl.	29.5 m.	29.3 gr.	30. m.
	Cotton	4	4. av.	58.3 gr.	58.6 gr.	60. gr.
	Water to make	1000	960. fl.	32. fl.	32. fl.	32. fl.
Aqua Creasoti	Creosote	1	0.905 fl.	145. m.	146.6 gr.	140. m.
	Distilled water	99	95. fl.	31.66 (=31⅔) fl.		
	Product	100	96. fl.	32. fl.	32. fl.	32 fl.
Aqua Fœniculi	Oil Fennel	2	2. fl.	32. m.	29.3 gr.	30. m.
	Cotton	4	4. av.	58.3 gr.	58.6 gr.	60. gr.
	Water to make	1000	.960 fl.	32. fl.	32. fl.	32. fl.
Aqua* Menthæ Piperitæ	Oil Peppermint	2	2.12 fl.	33.9 gr. (=34) m.	29.3 gr.	30. m.
	Cotton	4	4. av.	58.3 (=58) fl.	58.6 gr.	60. gr.
	Water to make	1000	960. fl.	32. fl.	32. fl.	32. fl.
Infusum Brayeræ	Brayera	6	6. av.	2 av.	2. av.	2. av.
	Water	100	96. fl.	32. fl.	32. fl.	32. fl.
Infusum Cinchonæ	Cinchona	6	6. av.	2. av.	2. av.	2. av.
	Arom. Sul. Acid	1	1. fl.	160 8 m.	144. m.**	144. m.
	Water to make	100	95.5 fl.	32. fl.	32. fl.	32. fl.
Infusum Digitalis	Digitalis	3	3. av.	217.6 gr.	219.6 gr.	220. gr.
	Cinnamon	3	3. av.	217.6 gr.	219.6 gr.	220. gr.
	Water	185	177.6 fl.	29.45 (=29½) av.	29.72 fl.	30. fl.
	Alcohol	15	17.55 fl.	2.91 (=2¾) fl.	2.97 fl.	3.25 fl.
	Water to make	200	193. fl.	32. fl.	32. fl.	32. fl.
Infusum Pruni Virg.	Wild Cherry	4	4. av.	1.33 (=1 5-16) av.	1.33 av.	1.33
	Water to make	100	96. fl.	32. fl.	32. fl.	32 fl.
Infusum Sennæ Comp.	Senna	6	6. av.	2.35 (=2⅜) av.	2.19 av.	2. av.
	Manna	12	12. av.	4.69 (=4 11-16) av.	4 39 av.	4. av.
	Magnes. Sulphate	12	12. av.	4.69 (=4 11-16)av.	4.39 av.	4. av.
	Fennel	2	2. av.	0.78 (=¾) av.	0.731 av.	0.093 av.
	Water	100	96. fl.	39.5 fl.	35.3 fl.	32. fl.
	Product	100	85.5 fl.	32. fl.	32. fl.	32. fl.
Linimentum Ammoniæ	Water of Ammonia	30	30. fl.	9.35 (=9⅜) fl	9.37 fl.	9.5 av.
	Cotton Seed Oil	70	72.7 fl.	22.65 (=22⅝) fl.	22.63 fl.	22.4 av.
	Product	100	102.7 fl.	32. fl.	32. fl.	32. av.
Linimentum Belladonnæ	Fl. Ext. Belladonna	95	102. fl.	30.8 fl.	32. av.	30 4 fl.
	Camphor	5	5. av.	1.51 av.	1.68 av.	1.6 av.
	Product	100	106. ± fl.	32. fl.	32. ± fl.	32. ± fl.
Linimentum Calcis	Lime water	50	48. fl.	15.37 (=15⅜) fl.	16. av.	16. av.
	Cotton Seed Oil	50	51.9 fl.	16.63 (=16⅝) fl.	16. av.	16. av.
	Product	100	99.9 fl.	32. fl.	32. ± fl.	32 ± fl.
Linimentum Camphoræ	Camphor	20	20. av.	6.25 (=6¼) av.	6.4 av.	6.4 av.
	Cotton Seed Oil	80	83. fl.	25.95 (=26) fl.	25.6 av.	25.6 av.
	Product	100	102.4 fl.	32. fl.	32. av.	32. av.

* Formula for Aqua Menthæ Viridis is identical with this, substituting oil of spearmint for oil of peppermint.

** 146 grains, which would be about 160 minims.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Linimentum Cantharidis....	Cantharides	15	15. av.	4.32 (=4 5-16) av.	4.36 av.	4. av.
	Oil Turpentine.....	100	111 3 fl.	32.1 fl.	29.1 av.	32. fl.
	Product....	100	111. ± fl.	32. fl.	32. ± fl.	32. fl.
Linimentum Chloroformi..	Chloroform...	40	25.9 fl.	9.08 (=9 1 12) fl.	16. av.	8.54 fl.
	Soap liniment.....	60	65.4 fl.	22.92 (=22 15-16) fl.	24. av.	23.46 fl.
	Product.	100	91.3 fl.	32. fl.	32. ± fl.	32. fl.
Linimentum Plumbi Subacetatis... ...	Sol. Lead Subacet ...	40	31.3 fl.	10.71 (=10 11-16) fl.	13.46 av.	12.8 av.
	Cotton Seed Oil.....	60	62.3 fl.	21.29 (=21 5-16) fl.	20.2 av.	19.2 av.
	Product.	100	93.6 fl.	32. fl.	32. ± fl.	(32. av.)
Linimentum Saponis.....	Soap.....	10	10. av.	2.98 (=3) av.	3.2 av.	2.86 av.
	Camphor.....	5	5. av.	1.49 (=1½) av.	1 6 av.	1.43 av.
	Oil Rosemary.....	1	1.067 fl.	0.318 (=5-16) fl.	0.35 fl.	0.321 fl.
	Alcohol..... ...	70	82 fl.	24.43 (=24 7-16) fl.	26.35 fl.	23.43 fl.
	Water	14	13.4 fl.	3.99 (=4) fl.	4.3 fl.	4. fl.
	Product.	100	107.4 fl.	32. fl.	32. fl.	32. fl.
Linimentum Sinapis Comp.	Vol. Oil Mustard.....	3	2.83 fl.	0.85 fl. (=408 m.)	.978 av.	.76 fl.
	Ext. Mezereum.....	2	2. av.	0.6 av. (=283 gr.)	.585 av.	.558 av.
	Camphor.....	6	6. av.	1.8 (=1 13-16) av.	1.755 av.	1.67 av.
	Castor Oil	15	15. fl.	4.5 (=4½) fl.	4.39 av.	4.58 fl.
	Alcohol.....	70	81.9 fl.	24.57 (=24½) fl.	24. fl.	24.4 fl.
	Product.	100	106.7 fl.	32. fl.	32. fl.	32. fl.
Linimentum Terebinthinæ..	Resin Cerate..... ...	65	65. av.	20.47 (=20½) av.	19.5 av.	19.5 av.
	Oil Turpentine.....	35	38.95 fl.	12.27 (=12¼) fl.	11.85 fl.	12. fl.
	Product.	100	101.9 fl.	32. fl.	30 av.	30. av.
Liquor Acidi Arseniosi..	Arsenious Acid.....	1	1. av.	0.33 av., = 144 gr.	146. gr.	148. gr
	Hydrochloric Acid...	2	1.66 fl.	0.555 av., = 266 m.	292. gr.	268. m.
	Distilled water.	25	24. fl.	8. fl.	8.22 fl.	8. fl.
	Product	100	96. ± fl.	32. fl.	32. fl.	32. fl.
Liq. Ammon. Acet. (2d form.)	Ammonium Carb.....	10	10. av.	1 905 av.	1.905 av.	2. av.
	Distilled water.....	80	76.8 fl.	14.63 fl.	14.66 fl.	16. fl.
	Acetic Acid.....	28	25.65 fl.	4.886 fl.	5.33 av.	4¾ fl.
	Distilled water.....	62	59.52 fl.	11.34 fl.	11.33 fl.	11¼ fl.
	Product.....	174.6	168. ± fl.*	32. ± fl.	(32. fl.)	32. ± fl.
Liq. Ars. et Hydrarg. Iodidi...	Iodide Arsenic.....	1	1. av.	0.333 av., = 146 gr.	146. gr.	140. gr.
	Red. Iod. Mercury....	1	1. av.	0.333 av., = 146 gr.	146. gr.	140. gr.
	Distilled water.....	15	14.4 fl.	4.8 fl.	4.89 fl.	4. fl.
	Product	100	96. fl.	32. fl.	32. fl.	32. fl.
Liquor Calcis....	Lime.....	1	1. av.	0.111 av., = 48.7 gr.	0.111 av.	0.125 av.
	Water	6	5.76 fl.	0.64 (=⅝) fl.	0.656 av.	0.75 fl.
	Distilled water.....	30	28.8 fl.	3.2 (=3¼) fl.	3.28 av.	4. fl.
	Product	300	288. fl.	32. fl.	32. fl.	32. fl.
Liq. Ferri Acetatis...	Sol. Iron Tersulph....	100	72.74 fl	28.12 (=28⅛) fl.	28.19 fl.	29. fl.
	Glac. Acetic Acid. ...	26	23.65 fl	9 14 (=9⅛) fl.	9.3 fl.	9.5 fl.
	Water of Ammonia...	80	80. fl.	30.93 (=31) fl	31 fl.	32. fl.
	Water	200	192 fl.	74.24 (=74¼) fl.	74.4 fl.	80. fl.
		350	336. fl.	129. fl.	130.1 fl.	128. fl.
		600	576.	222.7 (=223) fl.	223. fl	224. fl.
	Fluid reduced to.. ..	70	54. ± fl.	20.87 (=20⅞) fl.	27.06 fl.	28. av.
	Product.	100	82.8 fl.	32. fl.	(32. fl.)	32. fl.

* Calculated from Sp. Gr., stated 1.022; product should be 164.1.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounce.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Liq. Ferri. Chloridi.	Iron	15	15. av.	7.023 (=7) av.	7.03 av.	7. av.
		54	44.7 fl.	20.98 (=20 15-16) fl.	25.3 av.	21. fl.
	Hydrochloric Acid	27	22.35 fl.	10.46 (=10 15-32) fl.	12.65 av.	10.5 fl.
		5	4.14 fl.	1.94 (=1 15-16) fl.	2.34 av.	2. fl.
	Nitric Acid	8±	5 31 fl.	2.50 (=2.5±) fl.	3.75 av.	2.75 fl.
	Distilled water	25	24. fl.	11.24 (=11¼) fl.	11.25 fl.	11. fl.
	Product	100	68.34 fl.	32. fl.	32. fl	32. fl.
Liq. Ferri. Citratis	Sol. Iron Tersulph	165	76.38 fl.	32.08 (=32) fl.	44.1 av.	44.1 av.
	Citric Acid	30	30. av.	11.4 (=11 7-16) fl.	12.6 av.	12.6 av.
	Water Ammonia	84	84. fl.	35.28 (=35¼) fl.	35.7 fl.	35.7 fl.
		200	192. fl.	80.64 fl.=5 pints.	81.9 fl.	84. fl.
	Water	1000	960. fl.	403.2 fl.=25 pints.	403. fl.	403. fl.
		1200	1152. fl.	483.8 fl.=30 pints.	487. fl.	504 fl.
	Product	100	76.2 fl.	32. fl.	(32. fl.)	(32. fl.)
Liq. Ferri. et Quin. Cit.	Cit. Iron and Am	65	65. av*	12.675 av.	12.66 av.	12.65 av.
	Quinine	12	12. av.	2.34 av.	2.34 av.	2.34 av.
	Citric Acid	28	28. av.	5.46 av.	5.45 av.	5.46 av.
	Alcohol	30	35.1 fl.	68.44 fl.	7.1 fl.	7.32 fl.
	Distilled water	200	192. fl.	37.44 fl.	37.28 fl.	39. fl.
	Evaporate to	160	124. ± fl.	24.2± fl.	31.06 av.	28.2 av.
	Product	200	(164. fl. ±)	39. av. (=32 fl ?)	(39.05 av.)	(39. av.)
Liq. Ferri. Nitratis	Sol. Iron Tersulph	18	13.09 fl	4.58 (=4 9-16) fl.	4.59 fl	4.59 fl.
	Water Ammonia	15	15. fl.	5.25 (=5¼) fl.	5.25 fl.	5.25 fl.
	Nitric Acid	7	4.988 fl.	1.653 (=1⅝+) fl.	1.66 fl.	1.64 fl.
	Water	40	38.4 fl.	13.44 (=13 7-16) fl.	13 48 fl.	14. fl.
		100	96. fl.	33.6 (=33⅝) fl.	33.6 fl.	35. fl.
	Product	100	91.45 fl.	32. fl.	32. fl.	(32. fl.)
Liq. Ferri. Sub. Sulph.	Ferrous Sulphate	77 (672)	77. av.	35. av.	35.05 av.	35.5 av.
	Sulphuric Acid	7 (62)	3.653 fl.	1.658 (=1⅝+) fl.	3.232 av.	3.179 av.
	Nitric Acid	11 (96)	7.44 fl.	3.38 (=3⅜+) fl.	4.973 av.	5.054 av.
	Water	50 (443)	48. fl.	21.79 (=21¾) fl.	21.87 fl.	21.84 fl.
	Product	114 (1000	70.39 fl.	32. fl.	32. fl.	(32. fl.)
Liq. Ferri. Tersulph	Ferrous Sulphate	80	80. av.	17.6 (=17⅝) av.	17.66 av.	17.66 av.
	Sulphuric Acid	15	7.827 fl.	1.72 (=1¾) fl.	3.31 av.	3.31 av.
	Nitric Acid	11	7.488 fl.	1.636 (=1⅝) fl.	2.484 av.	2.484 av.
	Water	50	48. fl.	19.56 (=18 9-16) fl	10.76 fl.	11.03 fl.
	Product	200	145.5 fl.	32. fl.	32. fl.	(32. fl.)
Liquor Gutta-perchæ.	Gutta-percha	9	9. av.	4.365 (=4⅜) fl.	4.45 av.	4.57 av.
		91	59.15 fl.	28.7 (28¾) fl.	44.99 av.	29.7 fl.
	Chlororform (com.)	70	45.5 fl.	22.07 (22) fl.	35.58 av.	22 85 fl.
	Lead Carbonate	10	10. av.	4.84 (=4⅞) av.	4 96 av.	4.57 av.
	Product	100	66. ± fl.	32. fl.	(32. fl.)	32. fl.
Liq. Hydrarg. Nitratis	Red Oxide Mercury	40	40. av.	28. av.	28.1 av	28.44 av.
	Nitric Acid	45	30 43 fl.	21.3 (=21 5-16) fl.	10.36 fl.	21.33 fl.
	Distilled water	15	14.4 fl.	10.08 (=10) fl.	10.06 fl.	10.2 fl.
	Product	100	45.72 fl.	32. fl.	32. fl.	32. ± fl
Liq. Iodi Compositus	Iodine	5	5. av.	1.88 (=1 13-16) fl.	1.79 av.	1.78 av.
	Potassium Iodide	10	10. av.	3.65 (=3⅝) fl.	3.58 av.	3.56 av.
	Distilled water	85	81.6 fl.	29.84 (=29¾) fl.	29.25 fl.	29.8 fl.
	Product	100	87.5± fl.	32. fl.	32. ± fl.	32. fl.
Liquor Pepsini	Pepsini Sach	40	40. av.	1.49 (=1½) av.	1.487 av.	1.463 av.
	Hydrochloric Acid	12	10.08 fl.	.373 fl.=179 m.	0.446 av.	0.333 fl.
	Glycerin	400	307.24 fl.	11.44 (=11 7-16) fl.	14.83 av.	11.2 fl.
	Water	548	526.1 fl.	19.59 (=19⅝) fl.	19.52 fl.	19.2 fl.
	Product	1000	859.4 fl.	32. fl.	(32. fl.)	32. ± fl.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Liq. Plumbi Sub-acet.	Lead Acetate	170	170. av.	6.96 (=7) av.	6.9 av.	6.95 av.
	Lead Oxide	120	120. av.	4.91 (4 15-16) av.	4.9 av.	4.91 av.
	Distilled water	800	768. fl.	31.43 (31 7-16) fl.	31.11 fl.	32. fl.
	Product	1000	782. fl.	32. fl.	(32. fl.)	32. fl.
Liq. Plumbi Sub-acet. dil.	Sol. Lead Subacet	3	2.346 fl.	5.786 fl. =377 m.	0.792 fl.	0.78 fl.
	Distilled water	97	93.12 fl.	31.2 (=31⅕) fl.	31.38 fl.	31.22 fl.
	Product	100	95.47 fl.	32. fl.	32. fl.	32. fl.
Liquor Potassæ (I.)	Potass. Bicarb	90	90. av.	4.106 (=3⅛) av.	3.03 av.	3.33 av.
	Lime	40	40. av.	1.38 (=1⅜) av.	1.34 av.	1.33 av.
	Distilled water	400	384. fl.	13.96 fl.	12.96 fl.	13.33 fl.
		400	384. fl.	13.26 fl.	12.96 fl.	13.33 fl.
	Product	1000	926.8 fl.	32. fl.	32. fl.	32. fl.
Liquor Potassæ (II.)	Potassa	56	56. av.	1.934 (=1 15-16) av.	1.975 av.	2. av.
	Distilled water	944	906.24 fl.	31.13 (=31⅛) fl.	32. fl.	32. fl.
	Product	100	926 8 fl.	32. fl.	32. fl.	32. fl.
Liq. Potassii Arsenitis	Arsenious Acid	1	1. av.	0.338 av. =148. gr.	0.338 av.	0.338 av.
	Potass. Bicarb	1	1. av.	0.338 av. =148. gr.	0.338 av.	0.338 av.
	Co. Tinct. Lavend	3	3.25 fl.	1.097 (=1 1-16) fl.	1.026 fl.	1. fl.
	Distilled water	10	9.6 fl.	3.24 (=3¼) fl.	3.077 fl.	3. fl.
	Product	100	94.75 fl.	32. fl.	32. fl.	32. fl.
Liq. Potass. Citratis	Citric Acid	6	6. av.	2.13 (=2⅛) av.	2.11 av.	2.19 av.
	Potass. Bicarb	8	8. av.	2.84 (=2⅝) av.	2.81 av.	2.93 av.
	Water	40	36.8 fl.	13.08 (=13) fl.	13.45 fl.	13.66 fl.
		40	36.8 fl.	13.08 (=13) fl.	13.45 fl.	13.66 fl.
	Product	96.48*	91. ± fl	32. fl.	32. fl.	32. fl.
Liquor Sodæ (I.)	Sodium Carb	180	180. av.	6.35 (=6⅜) av.	6.86 av.	6.66 av.
	Lime	60	60. av.	2.12 (=2⅛) av.	2.29 av.	2. av.
	Distilled water	400	384. fl.	13.94 (=13 15-16) fl.	14.66 fl.	15. fl.
		400	384. fl.	13.94 (=13 15-16) fl.	14.66 fl.	15. fl.
	Product	1000	906.7 fl.	32. fl.	32. fl.	32. fl.
Liquor Sodæ (II.)	Soda	56	56. av.	1.98 (=2) av.		2. av.
	Distilled water	944	906.2 fl.	31.99 (=32) fl.		32. fl.
	Product	1000	906.7 fl.	32. fl.		32. fl.
Liquor Sodæ Chlorinatæ	Sodium Carb	100	100. av.	3.424 (=3 7-16) av.	3.63 av.	3.57 av.
	Chlorinated Lime	80	80. av.	2.7 (=2¾) av.	2.91 av.	2.86 av.
	Water	400	384. fl.	13.15 (=13⅛) fl.	14. fl.	3.43 (!) fl.
		400	384. fl.	13.15 (=13⅛) fl.	14. fl.	3.43 (!) fl.
	Product	1000	920. fl.	32. fl.	32. fl.	32. ? fl.
Liquor Sodii Arseniatis	Sodium Arseniate	1	1. av.	.337 fl. (=147½ gr.)	.336 av.	.336 av.
	Distilled water	99	95. fl.	32. fl.	32. fl.	32. fl.
	Product	100	95.+ fl.	32. fl.	32. fl.	32. fl.
Liq. Zinci Chloridi	Granulated Zinc	240	240. av.	12.44 (=12 7-16) av.	12.34 av.	12.5 av.
	Nitric Acid	12	8.11 fl.	0.42 fl. =202 m.	4.14 1 av.	0.457 fl.
	Zinc Carbonate	12	12. av.	0.622 (=⅝) av.	0.615 av.	0.622 av.
	Water	150	144. fl.	7.46 (=7½) fl.	7.85 fl.	9. fl.
	Product	1000	61.75 fl.	32. fl.	32. fl.	32. fl.
Mistura** Ammoniaci	Ammoniac	4	4. av.	1.26 (=1¼) av.	1.29 av.	1.26 av.
	Water	100	96. fl.	30.77 (=30¾) fl.	30.71 fl.	30.74 fl.
	Product	104	100. fl.	32. fl.	32. fl.	32. fl.

* 3.52 parts of $C O_2$ are lost out of the 100 parts of material.

** The formula for Mistura Asafœtidæ precisely similar to this.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Mistura Amygdaæ.....	Sweet Almonds.....	6	6. av.	1.91 (=1 15-16) av.	1.92 av.	1.876 av.
	Acacia.....	1	1. av.	0.319 av.=139½ gr.	0.32 av	0.313 av.
	Sugar.....	3	3. av.	0.956 (=15-16) av.	0.96 av.	0.94 av.
	Distilled water.....	100	96. fl.	30.6 (=30⅝) fl.	30.78 fl.	30.8 fl.
	Product	110	99.6 fl.	32. fl.	32. fl.	32. fl.
Mistura Chloroformi...	Chloroform Purif.. .	8	5.164 fl.	1.767 (=1¾+) fl.	2.194 av.	1.6 fl.
	Camphor.....	2	2. av.	0.684 (=11-16) av.	0.731 av.	0.658 av.
	Yelk of egg.....	10	9.55 fl.	3.25 (=3¼) fl.	2.925 av.	3.2 fl.
	Water	80	76.8 fl.	26.3 (=26⅜) fl.	28. fl.	25.6 fl.
	Product.....	100	98.5 fl.	32. fl.	32. fl.	32.? fl.
Mistura Cretæ...	Co. Chalk powder....	20	20. av.	7.19 (=7 3-16) av.	7.31 av.	8.76 av.
	Cinnamon water.....	40	38.4 fl.	13.81 (=13 13-16 fl.	14. fl.	16. fl.
	Water	40	38.4 fl.	13.81 (=13 13-16 fl.	14. fl.	16. fl.
	Product.....	100	89. fl.	32. fl.	32. fl.	32.? fl.
Mist. Ferri Composita.....	Ferrous Sulphate. ...	6	6. av.	0.203 av.=89. gr.	0.203 av.	0.195 av.
	Myrrh	18	18. av.	0.610 av.=267. gr.	0.608 av.	0.585 av.
	Sugar.....	18	18. av.	0.610 av.=267 gr.	0.608 av.	0.585 av.
	Potass. Carb.. . ..	8	8. av.	0.271 av.=118½ gr.	0.27 av.	0.26 av.
	Spirit Lavender.....	50	58.35 fl	1.98 (=2) fl.	1.95 fl.	1.78 fl.
	Rose water.....	900	864. fl.	29.25 (=29¼) fl.	29 23 fl.	28.44 fl.
	Product.....	1000	945. fl.	32. fl.	32. ± fl.	32. fl.
Mist. Ferri et Ammon. Acet..	Tinct. Iron Chlor....	2	1.96 fl.	0.69 fl.=330 m.	0.59 fl.	0.75 fl.
	Dil. Acetic Acid..	3	2.86 fl.	1.00 fl.	1.154 fl.	1. fl.
	Sol. Acet. Ammon....	20	18.8 fl.	6.61 (=6⅝) fl.	7.35 fl.	7. fl.
	Elixir Orange.....	10	8.65 fl.	3.04 (= 3) fl.	3.06 fl.	3. fl.
	Syrup.....	15	10.91 fl.	3.83 (=3 ⅞) fl.	30.65 fl. !	4. fl.
	Water	50	48. fl.	16.85 (=16⅝) fl.	19.02 fl.	24. fl.
	Product...	100	91.± fl.	32. fl.	32. fl.	32. fl.
Mist.Glycyrrhizæ Composita.....	Extract Licorice.....	3	3. av	1 016 av.=445 gr.	1.022 av.	1. av.
	Sugar.....	3	3. av.	1.016 av.=445 gr.	1.022 av.	1. av.
	Acacia.....	3	3. av.	1.016 av.=445 gr.	1.022 av.	1. av.
	Camph. Tinct. Opium	12	12.24 fl.	4.15 (=4¼+) fl.	4.1 fl.	4. fl.
	Wine Antimony.....	6	5.82 fl.	1.97 (=2) fl.	2.05 fl.	2. fl.
	Spt. Nitrous Ether...	3	3.49 fl.	1.18 (=1 3-16) fl.	1.18 fl.	1. fl.
	Water	70	67.2 fl.	22.75 (=22¾) fl.	22.91 fl.	24. fl.
	Product.....	100	94.5 fl.	32. fl.	32. fl.	32. fl.
Mist. Magnes. et Asafœtidæ.	Magnesium Carb	5	5. av.	1.76 av.=771 gr.	1.706 av.	1.646 av.
	Tinct. Asafœtida.....	7	7.7 fl.	2.70 fl. (=2 11-16)	2.267 fl.	2.5 fl
	Tinct. Opium	1	1.02 fl.	0.360 fl.=172 m.	0.338 fl.	0.313 fl.
	Sugar.....	10	10. av.	3.51 (=3½+) av.	3.47 av.	3. av.
	Water	77	73.9 fl.			
	Product.....	100	90.5 fl.	32. fl.	±32. fl. (?)	32. fl.
Mist. Rhei et Sodæ.... ..	Sodium Bicarb.....	30	30. av.	1.01 av.=442 gr.	1 00 av.	1.00 av.
	Fl. Ext. Rhubarb.....	30	27. (?) fl.	0.91 fl =437 m.	1.00 av.	0.75 fl.
	Spt. Peppermint.. ...	30	35.1 fl.	1.18 (=1 3-16) fl.	0.96 fl.	1.25 fl.
	Water	500	480. fl.	16.17 (=16⅛) fl.	16.39 fl.	16. fl.
	Product.....	1000	950. ± fl.	32. fl.	32. fl.	32. fl.
Mucilago Acaciæ	Acacia.....	34	34. av.	12.85 (=12⅞) av.	14.33 av.	16. av.
	Water	66	63.36 fl.	23.95 (=24) fl.	26.77 fl.	30. fl.
	Product.....	100	84.66	32. fl.	32. fl.	32. fl.
Mucilago Cydonii*.....	Cydonium	2	2. av.	0.66 av.=288 gr.	0.656 av.	0.656 av.
	Distilled water.....	100	96. fl.	32. fl.	32. fl.	32. fl.

* Precisely similar to this is the formula for Mucilago Sassafras Medullæ.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Mucilago Tragacanthæ	Tragacantha	6	6.	2.115 (=2⅛) av.	2.10 av.	1.985 av.
	Glycerin	18	13.82 fl.	4 87 (=4⅞) fl.	4.8 av.	4.57 fl.
	Water	76	73. fl.	25.74 (=25¾) fl.	25.6 fl.	25.14 fl.
	Product	100	91.3 fl.	32. fl.	32. fl.	32. fl.
Mulicago Ulmi	Elm	6	6. av.	2. av.	1.974 av.	1.974 av.
	Boiling water	100	96. fl.	32. fl.	32. fl.	32. fl.
Spiritus Ætheris	Stronger Ether	30	39.73 fl.	10.51 (=10½) fl.	10.63 fl.	10.24 fl.
	Alcohol	70	81.9 fl.	21.66 (=21⅝) fl.	22. fl.	21.76 fl.
	Product	100	121. ± fl.	32. fl.	32. fl.	32. fl.
Spiritus Æth. Comp	Stronger Ether	30	39.73 fl.	10.53 (=10½) fl.	10.8 fl.	10 39 fl.
	Alcohol	67	78.39 fl.	20.53 (=20½) fl.	21.07 fl.	20.77 fl.
	Ethereal Oil	3	3.165 fl.	0.839 fl. =403 m.	0.8 av.	0.81 fl.
	Product	100	120.7 ± fl.	32. fl.	32. fl.	
Spiritus Ammon. Arom	Ammon. Carb	40	40. av.	1.18 av. =516 gr.	1.177 av.	1.14 av.
	Water Ammonia	100	100. fl.	2.945 (=2 15-16) fl.	2.942 fl.	2.75 fl.
	Oil Lemon	12	13.54 fl.	0.399 fl. =192 m.	6 368 fl.	0.313 fl.
	Oil Lavender fls	1	1.06 fl.	0.032 fl. =15½ m.	0.0323 fl.	0.0274 fl.
	Oil Pimento	1	0.926 fl.	0.027=13 m.	0.0295 fl.	0.0243 fl.
	Alcohol	700	819. fl.	24.16 (=24⅛) fl.	24.12 fl.	22. fl.
	Water	140	134.4 fl.	3.97 (=4) fl.	3.97 fl.	4. fl.
	Product	1000	1065. fl.	32. fl.	32. fl.	32. fl.
Spiritus Anisi	Oil Anise	10	9.8 fl.	2.72 (=2¾) fl.	2.78 fl.	2.67 fl.
	Alcohol	90	105.3 fl.	29.28 (=20¼) fl.	29.24 fl.	29.33 fl.
	Product	100	115.1 fl.	32. fl.	32. fl.	32. fl.
Spiritus Aurantii	Oil Orange	6	6.7 fl.	1.835 (=1 13-16) fl.	1.8 fl.	1.94 fl.
	Alcohol	94	110. fl.	30.17 (=30 3-16) fl.	30.2 fl.	30.06 fl.
	Product	100	116.7 fl.	32. fl.	32. fl.	32. fl.
Spiritus Camphoræ	Camphor	10	10. av.	2.96 (=3) av.	3.08 av.	3. av.
	Alcohol	70	81.9 fl.	24.26 (=24¼) fl.	25.23 fl.	25. fl.
	Water	20	19.2 fl.	5.93 (=5 15-16) fl.	5.923 fl.	6. fl.
	Product	100	108. ± fl.	32. fl.	32. fl.	32. ± fl.
Spiritus Chloroformi	Chloroform Purif.	10	6.465 fl.	1.855 (=1⅞) fl.	1.91 fl.	1.94 fl.
	Alcohol	90	105.3 fl.	30.21 (=30¼) fl.	30.09 fl.	30.06 fl.
	Product	100	111.5 fl.	32. fl.	32. fl.	32. fl.
Spiritus Cinnamomi	Oil Cinnamon	10	9.28 fl.	2.61 (=2⅝) fl.	2.57 fl.	2.46 fl.
	Alcohol	90	105.3 fl.	29.39 (=29⅜) fl.	29.43 fl.	29.54 fl.
	Product	100	114.6 fl.	32. fl.	32. fl.	32. fl.
Spiritus Gaultheriæ	Oil Gaultheria	3	2.41 fl.	0.665 fl. =319 m.	0.66 fl.	.667 fl.
	Alcohol	97	113 5 fl.	41.33 (=31 15-16) n.	31.34 fl.	32. fl.
	Product	100	115.9 fl.	32. fl.	32. fl.	32.+ fl.
Spiritus Juniperi	Oil Juniper	3	3.33 fl.	0.902 fl. =433 m.	0.916 fl.	0.93 fl.
	Alcohol	97	113.5 fl.	31.1 fl.	31 08 fl.	32. fl.
	Product	100	116.8 fl.	32. fl.	32. fl.	32.+ fl.
Spiritus Juniperi Compositus	Oil Juniper	10	11.1 fl.	0.067 fl. =32 m.	0.068 fl.	0.055 fl.
	Oil Carraway	1	1.044 fl.	0.0068 fl =3 m.	0.0056 fl.	0.0055 fl.
	Oil Fennel	1	1.00 fl.	0.006 fl. =2 8-9 m.	0.0056 fl.	0.0055 fl.
	Alcohol	3000	3510. fl.	21.21 (=21 3-16) fl.	21.45 fl.	21.33 fl
	Water	1988	1908. fl.			
	Product	5000	5296. fl.	32. fl.	32. fl.	32. fl.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." [Ounces.]	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Spiritus Lavandulæ....	Oil Lavender fls	3	3.237 fl.	0.887 fl.=426 m.	0.907 fl.	0.97 fl.
	Alcohol.....	97	113.5 fl.	31.11 (=31⅛) fl.	31.09 fl.	31.03 fl.
	Product.....	100	116.7 fl.	32. fl.	32. fl.	32. fl.
Spiritus Limonis.	Oil Lemon.....	6	6.774 fl.	1.86 (=1⅞) fl.	1.85 fl.	2. fl.
	Lemon peel...	4	4. av.	1.1 av.	1.066 av.	1.1 av.
	Alcohol.....	90	105.3 fl.	28.91 (=28 15-16) fl.	28.8 fl.	28. fl.
	Product.....	100	116.6 fl.	32. fl.	32. fl.	32. fl.
Spiritus Menthæ Pip.**.....	Oil Peppermint.	10	10.67 fl.	2.95 (=2 15-16) fl.	3.15 fl.	2.75 fl.
	Peppermint.....	1	1. av.	0.176 av.=121 gr.	0.275 av.	0.183 av.
	Alcohol.....	90	105.3 fl.	29.06 (=29 1-16) fl.	29. fl.	28. fl.
	Product.....	100	116. fl.	32. fl.	32. fl.	32. fl.
Spiritus Myrciæ.	Oil Myrcia.....	16	15.36 fl.	0.26 fl.=125 m.	0.246 fl.	0.25 fl.
	Oil Orange peel..	1	1.116 fl.	0.019 fl.=9 m.	0.019 fl.	0.021.
	Oil Pimenta..... ..	1	0.94 fl.	0.0156 fl.=7½ m.	0.015 fl.	0.013. fl.
	Alcohol.....	1000	1770. fl.	19.85 (=19⅞) fl.	19.45 fl.	18. fl.
	Water	782	750.7 fl.	12 74 (=12¾) fl.	12.45 fl.	14. fl.
	Product.....	1800	1890. fl.	32. fl.	32. fl.	32. fl.
Spiritus Myristicæ. ...	Oil Nutmeg	3	3.1 fl.	0.9 fl.=432 gr.	0.867 fl.	0.97 fl.
	Alcohol.....	97	113.5 fl.	31.1 (=31⅛) fl.	31. fl.	31.03 fl.
	Product.....	100	116.6 fl.	32. fl.	32. fl.	32. fl.
Spiritus Odoratus.....	Oil Bergamot.....	16	17.6 fl.	0.496 fl.=239 m.	0.514 fl.	0.5 fl.
	Oil Lemon.....	8	9.08 fl.	0.255 fl.=123 m.	0.265 fl.	0.25 fl.
	Oil Rosemary.....	8	8.54 fl.	0.242 fl.=116 m.	0.25 fl.	0.25 fl.
	Oil Lavender.	4	4.32 fl.	0.122 fl.=58¾ m.	0.125 fl.	0.125 fl.
	Oil Orange fls.....	4	4.41 fl.	0.125 fl.=60 m.	0.127 fl.	0.125 fl.
	Acetic Ether.....	2	2.15 fl.	0.061 fl.=29¼ m.	0.064 fl.	0.063 fl.
	Water	158	151.7 fl.	4.29 (=4¼+) fl.	4.47 fl.	4.5 fl.
	Alcohol.....	800	936. fl.	26.49 (=26½) fl.	27.54 fl.	26. fl.
	Product.....	1000	1131. fl.	32. fl.	32. fl.	32. fl.
Syrupus.	Sugar.....	65	65. av.	28.6 (=28⅝) av.	28.44 av.	28.3 av.
	Water	35	33.6 fl.	14.78 (=14¾) fl.	14.67 fl.	14.16 fl.
	Product.....	100	72.74 fl.	32. fl.	32. fl.	32. fl.
Sprupus Acaciæ.	Mucil. Acacia.....	25	21.17 fl.	8.94 (=8 15-16) fl.	10.66 av.	8.7 fl.
	Syrup.....	75	54.6 fl.	23.06 (=23 1-16) fl.	32 av.	23.3 fl.
	Product....	100	75.77 fl.	32. fl.	(32± fl.)	32. fl.
Syrupus Acidi Citrici...	Citric Acid.....	8	8. av.	0.351 av.=153½ gr.	0.348 av.	0.343 av.
	Water	8	7.68 fl.	0.337 fl.=162 m.	0.334 av.	0.370 fl.
	Spirit Lemon..... ..	4	4.66 fl.	0.205 fl.=103 m.	0.203 av.	0.204 fl.
	Syrup.....	980	713. fl.	31.34 (=31⅜) fl.	31.4 fl.	31.53 fl.
	Product.....	1000	729. fl.	32. fl.	32. fl.	32. fl.
Syr. Acidi Hydriodici.....	Iodine	10	10. av.	0.433 av.=189 gr.	0.492 av.	0.434 av.
	Alcohol..	80	93.6 fl.	4.05 (=4) fl.	3.96 fl.	4. fl.
	Syrup.....	150	109.1 fl.	4.72 (=4¾) fl.	4.68 fl.	5. fl.
	Sugar.....	500	500. av.	21.62 (=21⅝) av.	21.11 av.	22. av.
	Spirit Orange.....	5	5.84 fl.	0.252 fl.=121 m.	0 248 fl.	0.25 fl.
	Water	150	144. fl.	6.23 (=6¼) fl.	7.59 fl.	6. fl.
	Product.....	1000	740. fl.	32. fl.	32. fl.	32. fl.
Syrupus Allii....	Fresh Garlic.....	15	15. av.	6.6 (=6⅝) av.	6.86 av.	6.46 av.
	Sugar...	60	60. av.	26.3 (=26 5-16) av.	27 44 av.	25.8 av.
	Dil. Acetic Acid	25	23.8 fl.	10.45 (=10½) fl.	10.86 fl.	10.14 fl.
	Expressed Fluid.....	15	14.27 fl.	6.29 (=6¼) fl.	6.29 fl.	6.46 fl.
		40				
	Product.	100	73. fl.	32. fl.	32. ± fl.	(32. fl.)*

** The formula for Spiritus Menthæ Viridis is the counterpart of this.

* These figures are calculated from the actual yield of the formula, not from the rough approximation given in the text.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces).	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Syrupus Althææ	Althæa	4	4. av.	1.72 (=1¾) av.	1.78 av.	2. av.
	Sugar	60	60. av.	25.86 (=25⅞) av.	26.67 av.	30. av.
	Water	60	57.6 fl.	24.83 (=24⅞) fl.	25.56 fl.	28. fl.
	Liquid	40	38.1 ± fl.	16.42 (=16 7-16) fl.	16. fl.	18. fl.
	Product	100	74.25 fl.	32. fl.	32. fl.	(32. fl.)*
Syrupus Amygdalæ	Sweet Almonds	10	10. av.	4.1 (=4⅛) av.	4.44 av.	4.33 av.
	Bitter Almonds	3	3. av.	1.23 (=1¼) av.	1.33 av.	1.3 av.
	Sugar	50	50. av.	20.51 (=20½) av.	22.22 av.	21.62 av.
	Orange fl. water	5	4.8 fl.	1.97 (=2) fl.	2.11 fl.	2.16 fl.
	Water	3	2.85 fl.	1.17 (=1 3-16) fl.	1.33 fl.	1.3 fl.
	Sugar	10	10. av.	4.18 (=4 3-16) fl.	4.44 av.	4.33 av.
	Water	30	28.8 fl.	11.82 (=11¾) fl.	12 9 fl.	12.97 fl.
	Expressed fluid	60	54. fl.	22.17 (=22 3-16) fl.	23.1 fl.	21.62 fl.
	Product	100	78. fl.	32. fl.	32. ± fl.	(32 fl.)*
Syrupus Aurantii	Sweet Orange peel	5	5. av.	2.14 (=2⅛) av.	2.22 av.	2.37 av.
	Alcohol	5	5 85 fl.	2.51 (=2½) fl.	2.67 fl.	2.84 fl.
	Prec. Phos. Calcium	1	1. av.	0.428 av=360 gr.	0.44 av.	0.473 av.
	Sugar	60	60. av.	25.7 (=25⅝) av.	26.67 av.	26.5 av.
	Water	30	28.8 fl.	12.34 (=12⅜) fl.	12.78 fl.	12.31 fl.
	Filtrate	40	39.2 ± fl.	16.79 (=16¾ ±) fl.	16.89 fl.	16.1 fl.
	Product	100	74.75 fl.	32. fl.	32. ± fl.	(32. fl.)*
Syr. Aurant. Florum	Orange fl. water	35	33.6 fl.	14.78 (=14¾) fl.	14.89 fl.	14.54
	Sugar	65	65. av.	28.6 (=28⅝) av.	28.61 av.	29.08
	Product	100	72.75 fl.	32. fl.	32. fl.	(32 fl.)*
Syr. Calcii Lactophos.	Prec. Phos. Calcium	22	22. av.	0.971 av. =425 gr.	0.973 av.	0.947 av.
	Lactic Acid	33	26.18 fl.	1.156 fl. =9¼ fl.drm	1.159 fl.	1.125 fl.
	Orange fl. water	80	76.8 fl.	3.39 (=3⅜) fl.	3.39 fl.	2 84 ! fl.
	Sugar	600	600. av.	26 49 (=26½) av.	26.67 av.	26 51 av.
	Water	300	288. fl.	12.71 (=12¾ fl.	12.85 fl.	12.31 fl.
	Hydrochloric Acid	q. s.				
	Water	1200	1152. fl.	50.85 (=50⅞) fl.	51.17 fl.	45.44 fl.
		1200	1152 fl.	50 85 (=50⅞) fl.	51.17 fl.	45.44 fl.
	Solution	350	332. ± fl.	14.66 (=13⅝) fl.	15.51 av.	13 26 fl.
	Filtrate	400	380. ± fl.	16.76 (=16¾) fl.	17.7 av.	16.09 fl.
	Product	1000	730. fl.	32. fl.	32. ± fl.	(32. fl.)*
Syrupus Calcis	Lime	5	5. av.	1.94 (=1 15-16) av.	2. av.	1.94 av.
	Sugar	30	30. av.	11.64 (=11⅝) av.	12. av.	11.64 av.
	Water	50	48. fl.	18.62 (=18⅝) fl.	(50 parts.)	19.4 fl.
		"equal vol."	68. ± fl.	26.38 ± fl.	equal vol.	equal vol.
	Product	100	82.5 fl.	32. fl.	32. ± fl.	(38.85 av.)
Syr. Ferri Bromidi.	Iron	30	30. av.	1.39 (=1⅜) av.	1.43 av.	1.5 av.
	Bromine	75	24. fl.	1.116 (=1¼) fl.**	3.43 av.	1.125 fl.
	Sugar	600	600 av.	27.82 (=27¾) av.	27.43 av.	28. av.
	Water	200	192. fl.	8.91 (=9) fl.	8.785 fl.	9. fl
		90	86.4 fl.	4.01 (=4) fl.	3.93 fl.	4. fl.
	Product	1000	69. ± fl.	32. fl.	32. ± fl.	32. fl.
Syr. Ferri Iodidi.	Iron	25	25. av.	1.15 (=1⅛) av.	1.143 av.	1.21 av.
	Iodine	82	82. av.	3.803 (=3 13-16) av.	3.75 av.	4. av.!
	Sugar	600	600. av.	27.82 (=27¾) av.	27.43 av.	28. av.
	Water	200	192. fl.	8.91 (=9) fl.	8.785 fl.	10. av.
		90	86.4 fl.	4.01 (=4) fl.	3.93 fl.	4. av.
	Product	1000	69. ± fl.	32. ± fl.	32. ± fl.	32. fl.

* These figures are calculated from the actual yield of the formula, not from the rough approximation given in the text. ** 3.478 oz. av. = 3 oz. and 209 grs.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Syr. Fer. Quin. et Strych. Phos	Phos. Iron (U. S. P.)	133	133. av.	0.591 av. = 259 gr.	0.61 av.	0.594 av.
	Quinine	133	133. av.	0.591 av. = 259 gr.	0.61 av.	0.594 av.
	Strychnine	4	4. av.	0.0178 av. = 7¾ gr.	0.0181 av.	0.177 av.
	Phosphoric Acid	800	570.4 fl.	2.535 (= 2¼ +) fl.	3.67 av.	36. fl.
	Sugar	6000	6000. av.	26.67 (= 26⅔) av.	27.5 av	27.3 av.
	Water	2500	2400. fl.	10.66 (= 10⅔) fl.	10.67 fl.	10.4 fl.
	Total Fluid	4000	3520. fl.	15.64 (= 15⅝) fl.	16.3 av.	15.6 fl
	Product	10000	7200. ± fl.	32. fl.	32. fl.	(32. fl.)*
Syr. Hypophosphitum	Calcium Hypophos.	35	35. av.	1.493 (= 1.5) av.	1.6 av.	1.49 av.
	Sodium "	12	12 av.	0.512 av. = 224 gr.	0.549 av.	0.5 av.
	Potassium "	12	12. av.	0.512 av. = 224 gr.	0.549 av.	0.5 av.
	Citric Acid	1	1. av.	0.0427 = 19 gr.	0.046 av.	0.041 av.
	Spirit Lemon.	2	2.34 fl.	0.1 fl. = 48 m.	0.104 fl.	0.094 fl.
	Sugar	500	500. av	21.33 (= 21⅓) av.	22.88 av.	21.69 av.
	Water	350	336. fl.	14 34 (= 14⅓) fl.	15.37 fl.	14.48 fl.
	Total Fluid	500	444. ± fl.	18.97 (= 19) fl.	22.88 av.	18.98 fl.
	Product	1000	750. fl.	32. fl.	(32. fl.)*	(32. fl.)*
Syr. Hypophos. c. Ferro	Lactate Iron	1	1. av.	0.428 av. = 187 gr.	0.457 av.	0.439 av.
	Syr. Hypophosphites.	99	74.25 fl.	31 78 (= 31⅘) fl.	32. fl.	32. fl.
	Product	100	74.75 fl.	32. fl.	32. ± fl	32. + fl.
Syrupus Ipecac.	Fl. Ext. Ipecac	5	5. ± fl.	2.167 (2⅙ +) fl.	2.15 av.	2.07 fl.
	Syrup	95	69.1 fl.	29.78 (= 29¾) fl.	40.91 av.	29.9 fl.
	Product	100	74. fl.	32. fl.	32. fl.	(32. fl.)*
Syrupus Krameriæ	Fl. Ext. Krameria	35	33.2 ± fl.	12 967 (= 13) fl.	14. av.	12. fl.
	Syrup	65	47.3 fl.	19.04 (= 19) fl.	23. av.	20. fl.
	Product	100	79.5 fl.	32. fl.	(32. ± fl.)	32. fl.
Syrupus Lactucarii	Fl. Ext. Lactucarium.	5	5. ± fl.	2.167 fl.	2.15 av.	2.06 fl
	Syrup	95	69. fl.	29.84 fl.	29.3 fl.	29.940 fl.
	Product	100	74. fl	32. fl.	32. fl.	
Syrupus Limonis	Lemon juice	40	37.3 ± fl.	16.3 (= 16⅓) fl.	17.78 av.	16.1 fl.
	Lemon peel	2	2. av.	0 874 (= ⅞) fl.	0.89 av.	0.95 av.
	Sugar	60	60. av.	26.23 (= 26¼) fl.	26.67 av.	26.51 av
	Total Fluid	40	37. ± fl.	16.2 ± fl.	17.78 av.	16.1 fl.
	Product	100	73.3 fl.	32. fl.	32. fl.	(32. fl.)*
Syr. Picis Liquidi	Tar	6	6. av.	2.58 (= 2 9-16) av.	2 67 av.	2.84 av.
	Water	12	11.52 fl.	4.95 (= 5) fl.	5.11 fl.	4.73 fl.
	Sugar	50	48. fl.	20.62 (= 20⅝) fl.	21.33 fl.	18.94 fl.
	Filtrate	60	60. av.	25.77 (= 25¾) av.	26.67 av.	26 51 av.
	Product	40	38.4 fl.	16.8 ± (= 16⅘ +) fl.	17.11 fl.	16.1 fl.
		100	74.5 ± fl.	32. fl.	32. fl.	(32. fl.)*
Syr. Pruni Virginiani	Wild Cherry	12	12. av.	5.26 (= 5¼) av.	5.33 av.	5.21 av.
	Sugar	60	60 av.	26.3 (26¼) av.	26.7 av.	26.51 av.
	Glycerin	5	3 84 fl.	1.68 (= 1 11-16) fl.	2.22 av.	1.89 fl.
	Percolate	35	32.5 fl.	14.3 (= 14⅓) fl.	14.2 fl.	14.2 fl.
	Product	100	73. ± fl.	32. fl.	32. fl.	(32. fl.)*
Syrupus Rhei	Rhubarb	90	90. av.	3.95 (= 3 15-16) av.	4. av.	3.79 av.
	Cinnamon	18	18. av.	0.79 av = 345 gr.	350 gr.	335 gr.
	Potass. Carbonate	6	6. av.	0.263 av. = 115 gr.	117 gr.	112 gr.
	Sugar	600	600. av.	26.31 (= 26 5 16) av.	27.33 av.	26.5 av.
	Water	420	413. fl.	18.11 (= 18⅛) fl.	18.97 fl.	18 97 fl.
	Total Fluid	400	372. ± fl.	16.31 (= 16 5-16) fl.	18.22 av.	96.1 fl.
	Product	1000	780. ± fl.	32. fl.	32. ± fl.	(32. fl.)*

* These figures are calculated from the actual yield of the formula, not from the rough approximation given in the text.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Syr. Rhei ** Aromaticus.	Aro. Tinct. Rhubarb.	10	9.6 fl.	4.1 (=4⅛) fl.	4.26 av.	4. fl.
	Syrup	90	65.5 fl.	27.9 (=27⅞) fl.	28.4 av.	28. fl.
	Product	100	75.1 fl.	32. fl.	32. ± fl.	32. fl.
Syrupus Rubi.	Fl. Ext. Rubus	20	18.4 fl.	7.75 (=7¾) fl.	8. av.	8. fl.
	Syrup	80	58.2 fl.	24.33 (=24 5-16) fl.	23. av.	24. fl.
	Product	100	76.6 fl.	32. fl.	32. ± fl.	32. fl.
	Juice Raspberries	40	39. fl.	16.86 (=16⅞) fl.		
	Sugar	60	60. av.	25.95 (=26) av.		
	Product	100	74. fl.	32. fl.		
Syr. Sarsæ Compositus.	Sarsaparilla	150	150. av.	6.6 (=6⅝) av.	6.88 av.	6.45 av.
	Guaiacum wood	20	20. av.	0.88 av. =385 gr.	408 gr.	339 gr.
	Pale Rose	12	12. av.	0.53 av. =231 gr.	233 gr.	225 gr.
	Licorice	12	12. av.	0.53 av. =231 gr.	233 gr.	225 gr.
	Senna	12	12. av.	0.53 av. =231 gr	233 gr.	225 gr.
	Sassafras	6	6. av.	0.264 av. =116 gr.	117 gr.	113 gr.
	Anise	6	6. av.	0.264 av =116 gr.	117 gr.	113 gr.
	Gaultheria	6	6. av.	0.264 av. =116 gr.	117 gr.	113 gr.
	Sugar	600	600. av.	26.4 (=26⅜) av.	26.66 av.	25.81 av.
	Diluted Alcohol	300	313. fl.	13.77 (=13¾) fl.	13.8 fl.	12.88 fl.
	Percolate	600	600. fl.	26.4 (=26⅜) fl.	25.6 ± fl.	24.76 fl.
	Evaporate to	300	276. ± fl.	12.14 (=12⅛) fl.	12.8 fl.	12 38 fl.
	Water	100	96. fl.	4.22 (=4¼) fl.		4.13 fl.
	Total Fluid	400	375. ± fl.	16.5 (=16½) fl.	17.07 fl.	16.57 fl.
	Product	1000	780. fl.	32. fl.	32. fl.	(32. fl.)*
Syrupus Scillæ.	Vinegar Squill	40	37.5 fl.	16.5 (=16½) fl.	16.44 fl.	16. fl.
	Sugar	60	60. av.	26.4 (=26⅜) av.	26.66 av.	26. av.
	Total Fluid	40	37.5 fl.	16.5 (=16½) fl.		
	Product	100	78 fl.	32. fl.	32. ± fl.	32. fl.
Syr. Scillæ Compositus.	Squill	120	120. av.	2.63 (=2⅝) av.	2.66 av.	2.5 av.
	Senega	120	120. av.	2.63 (=2⅝) av.	2.66 av.	2.5 av.
	Tartar Emetic	3	3. av.	0.066 av =29 gr.	29 gr.	28 gr.
	Sugar	1200	1200. av.	26.3 (=26 5-16) av.	26.66 av.	26. av.
	Calcium Phosphate	9	9. av.	0.197 av. =87 gr.	87 gr.	90 gr.
	Diluted Alcohol	300	313.5 fl.	6.87 (=6⅞) fl.	6.92 fl.	8. fl.
	Percolate	900	900. ± fl.	19.73 (=19¾) fl.	20. fl.	24. fl.
	Evaporate to	360	318. ± fl.	6.97 (=7) fl.	7.33 fl.	8. fl.
	Water	150	144. fl.	3.16 (=3 3-16) fl.	3.17 fl.	
	Filtered Fluid	750	690. ± fl.	15.13 (=15⅛) fl.	16. fl.	16. fl.
	Water	47	45 1 fl	0.99 (=1) fl.	1. fl.	1. fl.
	Product	2000	1460. fl.	32. fl.	32. ± fl.	32. fl.
Syrupus Senegæ.	Fl. Ext. Senega	160	160. ± fl.	7.05 ± (=7⅛) fl.	7.11 av.	7.53 fl.
	Water Ammonia	4	4. fl.	0.176 fl =84 m.	80 m.	85 m.
	Sugar	600	600. av.	26 4 (=26¾] av.	26.67 av.	26.5 av.
	Water	250	240. fl.	10.56 (=10 9-16) fl.	10.67	10.42 fl.
	Total Fluid	400	368. ± fl.	16.19 (=16 3-16) fl.	16. fl.	16.1 fl.
	Product	1000	728. fl.	32. fl.	32. fl.	(32. fl.)*
Syrupus Sennæ.	Senna	33	33. av.	14.52 (=14½) av.	14.67 av.	14.88 av.
	Sugar	60	60. av.	26.4 (=26⅜) av.	26.67 av.	26.97 av.
	Alcohol	4	4.68 fl.	2.06 (=2 1 16) fl.	2.06 fl.	1.86 fl.
	Oil Coriander	0.04	0.044 fl.	0.019 fl. =9½ m.	9 m.	7½ m.
	Water	160	153.6 fl.	67.58 (=67½) fl.	67.56 fl.	74.4 fl.
	Evaporate to	70	66.2 fl.	29.13 (=29⅛) fl.	30. fl.	29.76 fl.
	Filtrate	30	26.4 fl.	11.65 (=11⅝) fl.	12.33± fl.	13.95 fl.
	Product	40	36.5 fl.	16.11 (=16⅛) fl.	16. ± fl.	15.81 fl.
	Product	100	72.5 fl.	32. fl.	32. ± fl.	(32. fl.)*

* These figures are calculated from the actual yield of the formula, not from the rough approximation given in the text. ** The formula for Syrupus Rosæ is precisely similar.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." [Ounces.]	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Syrupus Tolutanus	Balsam Tolu	4	4. av.	1.76 (=1¾) av.	1.78 av.	1.25 av.
	Sugar	65	65. av.	28.6 (=28⅝) av.	28.9 av.	28. av.
	Water	35	33.6 fl.	14.78 (=14¾) fl.	14.80 fl.	13. fl.
	Product	100	72.75 fl.	32. fl.	32. fl.	32. fl.
Syrupus Zingiberis	Fl. Ext. Ginger	2	2.2± fl.	0.97± (=1) fl.	0.89 av.	0.976 fl.
	Sugar	65	65. av.	28.6 (=28⅝) av.	28.9 av.	29.3 av.
	Water	25	25. av.	11. av.	11.1 av.	11.7 av.
	Total Fluid	35	33.6 fl.	14.78 (14¾) fl.	14.80 fl.	14.64 fl.
		60	48.9 fl.	21.52 (=21½) fl.		21.48 fl.
	Product	100	72.75 fl.	32. fl.	32. ± fl.	(32. fl.)*
Tinctura Aconiti	Aconite	400	400. av.	11.43 (=11 7-16) av., or 10.97 fl. Fl. Ext.	11.3 av.	11. av.
	Tartaric Acid	4	4. av.	0.114 av. =50 gr.	49½ gr.	48 gr.
	Alcohol	200	234. fl.	6.69 (=6 11-16) fl.	6.59 fl.	6. fl.
	Product	1000	1120. fl.	32. fl.	32. fl.	32. fl.
Tinctura Aloes	Purified Aloes	10	10. av.	3.3 (=3 5-16) av.	3.2 av.	3. av.
	Ext. Glycyrrhiza	10	10. av.	3.3 (=3 5-16) av.	3.2 av.	3. av.
	Dilute Alcohol	80	82.8 fl.	27.5 (=27½) fl.	26.4 fl.	24. fl.
	Product	100	96.5± fl.	32. fl.	32. ± fl.	32. fl.
Tinct. Aloes et Myrrhæ	Purified Aloes	10	10. av.	2.91 (=2 15-16) av.	3.2 av.	3. av.
	Myrrh	10	10. av.	2.91 (=2 15-16) av.	3.2 av.	3. av.
	Alcohol	80	93.6 fl.	27.13 (=27⅛) fl.	26.4 fl	24 fl.
	Product	100	110. ± fl	32. fl.	32. fl.	32. fl.
Tinct. Arnicæ Flor.	Arnica Flowers	20	20. av.	6.34 (=6 5-16+) av., or 6 09 fl. Fl. Ext.	6.2 av.	6. av.
	Diluted Alcohol	40	41.4 fl.	13.12 (=13⅛) fl.	12.9 fl.	12. fl.
	Product	100	101. fl.	32. fl.	32. fl.	32 fl.
Tinct. Arnicæ Rad	Arnica root	10	10. av	3.13 (=3⅛) av., or 3.0 fl. Fl. Ext.	3.1 av.	3. av.
	Diluted Alcohol	10	10.35 fl.	3.24 (=3¼) fl.	3.2 fl.	3. fl.
	Product	100	102.3 fl.	32. fl.	32. fl.	32. fl.
Tinctura Asafœtidæ	Asafetida	20	20. av.	5.82 (=5 13-16) av., or 5.59 fl. Fl. Ext.	5.82 av.	6. av.
	Alcohol	80	93.6 fl.	27.13 (=27⅛) fl.	27.15 fl.	24. fl.
	Product	100	110. ± fl.	32. fl.	32. fl.	32. fl.
Tinct. Aurantii Amari	Bit. Orange peel	20	20. av.	6.34 (=6⅜) av., or 6.09 fl. Fl. Ext.	6.2 av.	6. av.
	Diluted Alcohol	20	20.7 fl.	6 55 (=6½) fl.	6.45 fl.	6. fl.
	Product	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinct. Aurantii Dulcis	Sw't Orange peel	20	20. av.	5.68 (=5 11-16) av., or 5.45 fl. Fl. Ext.	5.64 av.	6. av.
	Alcohol	80	93.6 fl.	26.56 (=26½) fl.	26.3 fl.	24. fl.
	Product	100	112.7± fl.	32. fl.	32. fl.	32. fl.
Tinctura Belladonnæ	Belladonna leaf	15	15. av.	4.73 (=4¾) av., or 4.54 fl. Fl. Ext.	4.65 av.	5. av.
	Dilute Alcohol	20	20.7 fl.	6.53 (=6½) fl.	6.4 fl.	6. fl.
	Product	100	101.5 fl.	32. fl	32. fl.	32. fl.

* These figures are calculated from the actual yield of the formula, not from the rough approximation given in the text.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure," (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Tinctura Benzoini	Benzoin....	20	20. av.	5 82 (=5 13-16) av. or 5.59 fl. Fl. Ext.	6. av.	6. av.
	Alcohol.....	80	98 6 fl.	27.13 (=27⅛) fl.	28. fl.	24. fl.
	Product.....	100	110± fl.	32. fl.	32. fl.	32. fl.
Tinctura Benzoini Co....	Benzoin.....	12	12. av.	3.49 (=3½) av.	3.69 av.	3.5 av.
	Purified Aloes	2	2. av.	0.58 av.=254 gr.	269 gr.	260 gr.
	Storax..	8	8. av.	2.33 (=2 5-16) av.	2.46 av.	2.5 av.
	Balsam Tolu.....	4	4. av.	1.16 (2⅛) av.	1.23 av.	1.25 av.
	Alcohol.....	75	87.75 fl.	25.53 (=25½) fl.	27.1 fl.	24. fl.
	Product....	100	110. ± fl.	32. fl.	32. fl.	32. fl.
Tinctura Bryonise.....	Bryonia..	10	10. av.	2.78 (=2¾) av. or 2.67 fl. Fl. Ext.	2.83 av.	2.75 av.
	Alcohol..... ...	10	11.7 fl.	3.26 (3¼) fl.	3.3 fl.	3. fl.
	Product.....	100	115. ± fl	32. fl.	32. fl.	32. fl.
Tinctura Calendulæ.....	Calendula..... ...	90	20. av.	6.34 (= 5-16) av. or 6.09 fl. Fl. Ext.	6.4 av.	6. av.
	Diluted Alcohol.....	40	41.4 fl.	13.12 (=13⅛) fl.	13.34 fl.	12. fl.
	Product.....	100	101. fl	32. fl.	32. fl.	32. fl.
Tinctura Calumbæ.....	Calumba.	10	10. av.	3 14 (=3 ⅛) av. or 3.01 fl. Fl. Ext.	3. av.	3. av.
	Alcohol 3 / Water 2	10	10.64 fl	3.34 (=3 5-16) fl.	3.25 fl.	2 / 1 3. fl.
	Product....	100	105. fl.	32. fl.	32. fl.	32. fl.
Tinct. Cannabis Ind..	Indian Cannabis. ...	20	20. av.	5.61 (=5⅝) av or 5.39 fl. Fl. Ext.	5.49 av.	5.5 av.
	Alcohol.....	20	23.4 fl.	6.56 (6½) fl.	6.4 fl.	6. fl.
	Product.	100	114. fl.	32. fl.	32. fl.	32. fl.
Tinctura Cantharidis....	Cantharides..	5	5. av.	1.38 av. =605 gr. or 588 m. Fl. Ext.	600 gr.	600 gr.
	Alcohol.....	8	35. fl.	0.97 (=1) fl.		0.75 fl.
	Product.....	100	116. fl.	32. fl.	32. fl.	32. fl.
Tinctura Capsici.	Capsicum.....	5	5. av.	1.4 av. =612 gr. or 645 m. Fl. Ext.	617 gr.	600 gr.
	Alcohol 19 / Water 1	8	3.43 fl.**	0.96 (=1) fl.	315 / 10	64 / 8 0.63 fl.
	Product.....	100	115. fl	32. fl.	32. fl.	32. fl.
Tinctura Cardamomi ...	Cardamom.....	15	15. av.	4.7 (=4¾) av. or 4.51 fl. Fl. Ext.	4.65 av.	5. av.
	Diluted Alcohol.....	15	15.5 fl.	4.86 (=4⅞) fl.	4.77 fl.	4. fl.
	Product.....	100	102. fl.	32. fl.	32. fl.	32. fl.
Tinct. Card. Composita....	Cardamom..	20	20. av.	0.637 av.=278 gr.	280 gr.	280 gr.
	Cinnamon..	20	20. av.	0.637 av.=278 gr.	280 gr.	280 gr.
	Carraway..	10	10. av.	0.318 av.=139 gr.	140 gr.	140 gr.
	Cochineal..... ...	5	5. av.	0.159 av.=69½ gr.	70 gr.	70 gr.
	Glycerin.....	60	46.2 fl.	1.47 (=1½) fl.	1.92 av.	1.5 fl.
	Diluted Alcohol.....	25	25.9 fl.	0.823 (=13-16) fl.	0.8 fl.	0.75 fl.
	Product..... ..	1000	100 5 fl.	32. fl.	32. fl.	32. fl.
Tinct. Catechu Composita....	Catechu.....	12	12. av.	3.9 (=3 15-16) av.	3.84 av.	4. av.
	Cinnamon..... ...	8	8. av	2.6 (=2⅝) av.	2.56 av.	2.69 av.
	Diluted Alcohol..	15	15.5 fl	5.03 (=5) fl.	4.96 fl.	4. fl.
	Product.....	100	98.5 fl.	32. fl.	32. fl.	32. fl.

* Alcohol 11, water 6 volumes.
** Alcohol 23, water 1 volume.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Tinctura Chiratæ	Chirata	10	10. av.	3.14 (=3¼) av. or 3. fl. Fl. Ext.	3.1 av.	3. av.
	Diluted Alcohol	10	10.35 fl.	3.25 (=3⅜) fl.	3.22 fl.	2.5 fl.
	Product	100	102 fl.	32. fl.	32. fl.	32. fl.
Tinctura Cimicifugæ	Cimicifuga	20	20. av.	5.69 (=5 11-16) av., or 5.46 fl. Fl. Ext.	5.64 av.	5.5 av.
	Alcohol	15	17.5 fl.	4.98 (=5) fl.	4.94 fl.	4.5 fl.
	Product	100	114. fl.	32. fl.	32. fl.	32. fl.
Tinctura Cinchonæ	Yellow Cinchona	20	20. av.	6.24 (=6¼) av.	6. av.	6. av.
	Glycerin	10	7.7 fl.	2.4 (=2½) fl.	3. av.	2.25 fl.
	Alcohol	65	76. fl.	23.73 (=23¾) fl.	22.87 fl.	23. fl.
	Water	25	24. fl.	7.49 (=7½) fl.	7.25 fl.	7. fl.
	Mixture (above)	(20)	21.65 fl.	6.56 (=6½) fl.	6. av.	5.5 fl.
	Product	100	102.5 fl.	32. fl.	32. fl.	32. fl.
Tinct. Cinchonæ Comp.	Red Cinchona	10	10. av.	2.98 (=3) av.	2.96 av.	3. av.
	Bit. Orange peel	8	8. av.	2.39 (=2⅜) av.	2.37 av	2.5 av.
	Serpentaria	2	2. av.	0.597 av. = 261 gr.	258 gr.	219 gr.
	Glycerin	10	7.7 fl.	2.3 (=2 5-16) fl.	2.96 av.	2.25 fl.
	Alcohol	80	93.6 fl.	27.93 (=28) fl.	28. fl.	28. fl.
	Water	10	9.6 fl.	2.86 (=2⅞) fl.	2.82 fl.	3. fl.
	Mixture (above)	20	21.9 fl.	6.29 (=6¼) fl.	5.9 av.	5.5 fl.
	Product	100	107.3 fl.	32. fl.	32. fl.	32. fl.
Tinctura Cinnamomi	Cinnamon	10	10. av	3.08 (=3⅛) av., or 2.96 fl. Fl. Ext.	3. av.	3. av.
	Alcohol 3 Water 2	5	350 19.1 } 5.26 fl	1.62 (=1⅝) fl.	1.62 fl.	94 14 } 1.5 fl.
	Product	100	104. fl.	32. fl.	32. fl.	32. fl.
Tinctura Colchici	Colchicum seed	15	15. av.	4.73 (=4¾) av., or 4.54 fl. Fl. Ext.	4.65 av.	5. av.
	Dilute Alcohol	15	15.5 fl	4.89 (=4⅞) fl.	4.77 fl.	4. fl.
	Product	100	101.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Conii	Conium (seed)	150	150. av.	4.73 (=4¾) av., or 4.54 fl. Fl. Ext.	4.65 av.	5. av.
	Dil. Hydrochl. Acid	4	3.66 fl.	0.012 av. = 55 m.	54.2 gr.	60 m.
	Diluted Alcohol	45	46.6 fl.	1.47 (=1½) fl.	1.22 fl.	2. fl.
	Product	1000	1015. fl.	32. fl.	32. fl.	32. fl.
Tinctura Croci	Saffron	10	10 av.	3.14 (=3⅛) av., or 3. fl. Fl. Ext.	3.12 av.	3. av.
	Diluted Alcohol	10	10.35 fl.	3.25 (=3¼) fl.	3.22 fl.	2.5 fl.
	Product	100	102. fl.	32. fl.	32. fl.	32. fl.
Tinctura Cubebæ	Cubeb	10	10. av.	3.14 (=3⅛) av., or 3. fl. Fl. Ext.	3.10 av.	3. av.
	Diluted Alcohol	10	10.35 fl.	3.25 (=3⅜) fl.	3.23 fl.	2.5 fl.
	Product	100	102. fl.	32. fl.	32. fl.	32. fl.
Tinctura Digitalis	Digitalis	15	15. av.	4.73 (=4¾) av., or 4.54 fl. Fl. Ext.	4.65 av.	5. av.
	Diluted Alcohol	15	15.5 fl.	4.89 (=4⅞) fl.	4.77 fl.	4. fl.
	Product	100	101.5 fl.	32. fl.	32 fl.	32. fl.
Tinct. Ferri Acetatis	Sol. Iron Acetate	50	41.4 fl.	13.66 (=13⅝+) fl.	13.5 fl.	13.65 fl.
	Alcohol	30	35.1 fl.	11.58 (=11 9-16) fl.	11.45 fl.	11.55 fl.
	Acetic Ether	20	21.5 fl.	7.1 (=7⅛) fl.	7.06 fl.	6.83 fl.
	Product	100	97± fl. *	32. fl.	32. fl.	32. fl.

* According to U. S. P. about 101.0 fl., but this cannot be true.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Tinct. Ferri Chloridi	Sol. Iron Chloride	35	23.95 fl.	7.80 (7 13-16) fl.	7.68 fl.	8. fl.
	Alcohol	65	76.05 fl	24.78 (24¾) fl.	24.32 fl.	25. fl.
	Product	100	98.2± fl *	32. fl.	32. fl.	32. fl.
	Nutgall	20	20. av.	6.56 (=6 9-16) av. or 6.30 fl. Fl. Ext.	6.02 av.	6. av.
Tinctura Gallæ	Glycerin	10	7.7 fl.	2.53 (=2½) fl.	3.31 av.	2.25 fl.
	Diluted Alcohol	90	93 15 fl.	30.57 (=30½) fl.	29.7 fl.	30. fl.
	Product	100	97.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Gelsemii	Gelsemium	15	15. av.	4.25 (=4¼) av. or 4.08 fl. Fl. Ext.	4.11 av.	4.5 av.
	Alcohol	10	11.7 fl	3.26 (=3¼) fl.	3.2 fl.	3. fl.
	Product	100	115. fl.	32. fl.	32. fl.	32. fl.
Tinctura Gentianæ Comp.	Gentian	8	8. av.	2.53 (=2½) av.	2.51 av.	2.5 av.
	Bit. Orange peel	4	4. av.	1.26 (=1¼) av.	1.26 av.	1.25 av.
	Cardamom	2	2. av.	0.63 (=⅝) av.	0 63 av.	0.625 av.
	Diluted Alcohol	10	10.35 fl	3.27 (=3¼) fl.	3.22 fl.	3. fl.
	Product	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinctura Guaiaci	Guaiac	20	20. av.	5.72 (5¾) av. or 5.49 fl. Fl. Ext.	6. av.	5.5 av.
	Alcohol	80	93.6 fl.	26.77 (=26¾) fl	28.13 fl.	24. fl.
	Product	100	112. fl.	32. fl.	32. fl.	32. fl.
Tinct. Guaiaci Ammon.	Guaiac	20	20. av	6.18 (=6 3-16) av. or 5.93 fl. Fl. Ext.	6.4 av.	5.5 av.
	Arom. Spt. Ammonia.	80	86.8 fl.	26.84 (=26⅞) fl.	28. fl.	24. fl.
	Product	100	108.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Humuli	Hops	20	20. av.	6.34 (6⅜) av. or 6.09 fl. Fl. Ext.	6.19. av.	6 av.
	Diluted Alcohol	40	41.4 fl.	13.11 (=13⅛) fl.	12.9 fl.	12. fl.
	Product	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinctura Hydrastis	Hydrastis	20	20. av.	6.34 (=6⅜) av. or 6.09 fl. Fl. Ext.	6.19 av.	6. av.
	Diluted Alcohol	15	15.5 fl.	4.91 (=4 15-16) fl.	4.77 fl.	4.5 fl.
	Product	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinctura Hyoscyami	Hyoscyamus	15	15. av.	4.73 (4¾) av. or 4.54 fl. Fl. Ext.	4.8 av.	5. av.
	Diluted Alcohol	15	15.5 fl.	4.89 (=4⅞) fl.	4.93 fl.	4.5 fl.
	Product	100	101.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Iodinii	Iodine	8	8. av.	2.33 (=2 5-16 +) av.	2.34 av.	2.243 av.
	Alcohol	92	107.6 fl	31.6 (=31⅝) fl.	31.6 fl.	31.6 fl.
	Product	100	110. ± fl.	32. fl.	32. ± fl.	32. ± fl.
Tinct. Ipecac. et Opii	Deod. Tinct. Opium	100	97. fl.	30.9 (=30 15-16) fl.	32. av	32. fl.
	Fl. Ext. Ipecac	10	10. ± fl.	3 18 (=3 3-16) fl.	3.2 av.	3.2 fl.
	Evaporate to	85	80.75 fl.	25.72 (=25¾) fl.	27.2 av.	25.6 fl.
	Product	100	100.5 fl	32. fl.	32. ± fl.	32. fl.
Tinctura Kino	Kino	10	10. av.	3.11 (=3⅛) av.	3.2 av.	3.29 av.
	Glycerin	15	11.5 fl.	3.57 (=3 9-16) fl.	4.8 av.	4. fl.
	Alcohol	60	70.2 fl	21.81 (=21 13-16) fl.	22 4 fl.	24. fl.
	Water	15	14 4 fl.	4.47 (=4½) fl.	4.6 fl.	5. fl.
	Mixture	30	31.42 fl.	9 76 (=9¾) fl.	9.6 fl.	12. fl.
	Product	100	103. fl.	32. fl.	32. ± fl.	32. fl.

* According to U. S. P., 97.2, giving a large allowance for condensation.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." [Ounces.]	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Tinctura Krameriæ.. ...	Krameria.....	20	20. av.	6.34 (=6 5-16) av. or 6.09 fl. Fl. Ext.	6.19 av.	6. av.
	Diluted Alcohol.. ...	20	20.7 fl.	6.55 (=6½) fl.	6.55 fl.	6. fl.
	Product.....	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinct. Lavand. Comp..	Oil Lavender....	8	8.63 fl.	0.256 fl.=123 m.	123 m.	120 m.
	Oil Rosemary.....	2	2.13 fl.	0.063 fl.=30.3 m.	30.3 m.	30. m.
	Cinnamon.....	18	18. av.	0.53 av.=228 gr.	232 gr.	246 gr.
	Cloves..	4	4. av.	0.118 av.=52 gr.	51 gr.	55 gr.
	Nutmeg	10	10. av.	0.296 av.=130 gr.	129 gr.	137 gr.
	Red Saunders.....	8	8. av.	0.237 av.=104 gr.	103 gr.	109 gr.
	Alcohol.....	680	795.6 fl.	23.57 (=23 9-16) fl.	23.5 fl.	24. fl.
	Water	270	259.2 fl.	7 68 (=7 11-16) fl.	7.64 fl.	8. fl.
	Product.....	1000	1080. fl	32. fl	32. fl.	32. fl.
Tinctura Lobeliæ.....	Lobelia...	20	20. av.	6.34 (6⅜) av. or 6.09 fl. Fl. Ext.	6.19 av.	6. av.
	Diluted Alcohol.....	20	20.7 fl.	6.55 (=6½) fl.	6.55 fl.	6. fl.
	Product..... ...	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinctura Matico.	Matico.....	10	10. av.	3.14(=3⅛+) av. or 3. fl. Fl. Ext.	3.1 av.	3. av.
	Diluted Alcohol.....	10	10.35 fl.	3.25 (=3¼) fl.	3.23 fl.	3. fl.
	Product.....	100	102. fl.	32. fl.	32. fl.	32. fl
Tinctura Moschi.	Musk..	10	10. av.	3.14 (=3⅛+) av.	3.2 av.	3.11 av.
	Alcohol..	45	52.65 fl.	16.53 (=16½) fl.	16.8 fl.	16. fl.
	Water	45	43.2 fl.	13.56 (=13½) fl.	14. fl.	14. fl.
	Product.....	100	102. fl.	32. fl.	32. ± fl.	32. fl.
Tinctura Myrrhæ.	Myrrh	20	20. av.	5.61 (=5⅝) av.	5.64 av.	5.5 av.
	Alcohol.....	80	93.6 fl.	26.25 (=26¼) fl.	26.32 fl.	24. fl.
	Product.....	100	114.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Opii...	Powdered Opium.....	10	10. av.	3.17 (=3 3-16) av.	3.2 av.	3.2 av.
	Water	40	38.4 fl.	12.17 (12 3-16) fl.	12.3 fl.	12.8 fl.
	Alcohol....	40	46.8 fl.	14.81 (=14 13-16) fl.	15.8 fl.	14.4 fl.
	Product.....	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinct. Opii Camphorata...	Powdered Opium ...	4	4. av.	0.126 av.=55 gr.	55 gr.	56 gr.
	Benzoic Acid.....	4	4. av.	0.126 av.=55 gr.	55 gr.	56 gr.
	Camphor.....	4	4. av.	0.126 av.=55 gr.	55 gr.	56 gr.
	Oil of Anise.....	4	3.92 fl.	0.124 fl.=59 m.	59 m.	43 m.
	Glycerin.....	40	30.7 fl.	0.969 (=1) fl.	552 gr.	1 fl.
	Diluted Alcohol	900	932. fl.	29.37 (=29⅜ fl.	29.4 fl.	28.8 fl.
	Product.....	1000	1015. fl.	32. fl.	32. fl.	32. fl.
Tinct. Opii Deodorata.....	Powdered Opium.....	10	10. av.	3.30 (=3 5-16) av.	3.28 av.	3.29 av.
	Ether.....	20	25.6 fl.	8.45 (=8¼) fl.	8.4 fl.	8. fl.
	Alcohol.....	20	23.4 fl.	7.72 (=7¾) fl.	8.1 fl.	7.2 fl.
	Product.....	100	97. fl.	32. fl.	32. fl	32. fl.
Tinctura Physostigmatis	Physostigma.	10	10. av.	2 76 (=2¾) av. or 2.65 fl. Fl. Ext.	2.74 av.	2.75 av.
	Alcohol.....	10	11.7 fl.	3.24 (=3¼) fl.	3.2 fl.	3. fl.
	Product...	100	116. fl.	32. fl.	32. fl.	32. fl.
Tinctura Pyrethrii.....	Pyrethrum.....	20	20. av.	5.61 (=5⅝) av. or 5.39 fl. Fl. Ext.	5.65 av.	5.5 av.
	Alcohol.....	15	17.6 fl.	4.92 (=4 15-16) fl.	4.95 fl.	5. fl.
	Product.....	100	1.14 fl.	32. fl.	32. fl	32 fl.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces).	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Tinctura Quassiæ	Quassia	10	16. av.	8.14 (=8½) av., or 8. fl. Fl. Ext.	8.1 av.	8. av.
	Diluted Alcohol	10	10.35 fl.	8.25 (=8¼) fl.	8.23 fl.	8. fl.
	Product	100	102. fl.	32. fl.	32. fl.	32. fl.
Tinctura Rhei	Rhubarb	12	12. av.	3.8 (=3 13-16) av., or 3.65 fl. Fl. Ext.	3.84 av.	4. av.
	Cardamom	2	2. av.	0.63 av., or 0.61 fl. Fl. Ext.	0.64 av.	0.66 av.
	Diluted Alcohol	10	10.35 fl.	8.28 (=8¼) fl.	4.1 fl.	3. fl.
	Product	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinct. Rhei Aromatica	Rhubarb	20	20 av.	6.45 (=6½) av.	6.67 av.	6.5 av.
	Cinnamon	4	4. av.	1.29 (=1 5-16) av.	1.33 av.	1.25 av.
	Cloves	4	4. av.	1.29 (=1 5-16) av.	1.33 av.	1.25 av.
	Nutmeg	2	2 av.	0.65 av.=384 gr.	0.66 av.	0.62 av.
	Diluted Alcohol	15	15.52 fl.	5.01 (=5) fl.	5.17 fl.	4. fl.
	Product	100	99.2 fl.	32. fl.	32. fl.	32. fl.
Tinct. Rhei dulcis	Rhubarb	8	8. av.	2.54 (=2½+) av.	2.56 av.	2.5 av.
	Glycyrrhiza	4	4. av.	1.27 (=1¼, av.	1.28 av.	1.25 av.
	Anise	4	4. av.	1.27 (=1¼) av.	1.28 av.	1.25 av.
	Cardamom	1	1. av.	0.32 av.=189 gr.	0.32 av.	0.32 av.
	Diluted Alcohol	15	15.52 fl.	4.94 (=4 15-16) fl.	4.96 fl.	4. fl.
	Product	100	100.6 fl.	32. fl.	32. fl.	32. fl.
Tinctura Sanguinariæ	Sanguinaria	15	15. av.*	4.57 (=4 9-16) av. or 4.39 fl. Fl. Ext.	4.5 av.	4 5 av.
	Alcohol 2 / Water 1	10	40.73 fl.	3.27 (=3¼) fl.	3.25. fl.	2. fl.
	Product	100	105. fl.	32. fl.	32. fl.	32. fl.
Tinct. Saponis Viridis	Green Soap	65	65. av.	22.13 (=22⅛) av.	22.13 av.	21.33 av
	Oil of Lavender	2	2.16 fl.	0.735 fl.=358 m.	0.74 fl.	0.8 fl.
	Alcohol	33	38.6 fl.	13.14 (=13⅛) fl.	13.14 fl.	12.8 fl.
	Product	100	94. fl.	32. fl.	(34.15 av.)	32. fl.
Tinctura Scillæ	Squill	15	15. av.	4.76 (=4¾) av. or 4.57 fl. Fl. Ext.	4.8 av.	5. av.
	Diluted Alcohol	20	20.7 fl.	6.56 (=6 9-16) fl.	6.67 fl.	6. fl.
	Product	100	101. fl.	32. fl.	32. fl.	32. fl.
Tinctura Serpentariæ	Serpentaria	10	10. av.	3.13 (=3⅛) av. or 3 fl. Fl. Ext.	3.1 av.	3. av.
	Diluted Alcohol	10	10.35 fl.	3.21 (3¼) fl.	3.48 fl.	3. fl.
	Product	100	102.3 fl.	32. fl.	32. fl.	32. fl.
Tinctura Stramonii	Stramonium seed	10	10. av.	3.12 (=3⅛) av. or 3. fl. Fl. Ext.	3.1 av.	3. av.
	Diluted Alcohol	10	10.35 fl.	3.24 (=3¼) fl.	3.23 fl.	3. fl.
	Product	100	102.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Sumbul	Sumbul	10	10. av.	2.78 (2¾ +) av. or 2.67 fl. Fl. Ext.	2.82 av.	2 75 av.
	Alcohol	10	11.7 fl.	3.26 (=3 ¼) fl	3.29 fl.	2.5 fl.
	Product	100	115. fl.	32. fl.	32. fl.	32. fl.
Tinctura Tolutana	Tolu	10	10. av.	2.83 (=2 13-16) av.	2.91 av.	3. av.
	Alcohol	90	105.3 fl.	29.82 (=29 13-16) fl.	30.67 fl.	30. fl.
	Product	100	113. ± fl.	32. fl.	32. fl.	32. fl.

* Alcohol 24.4, water 10 volumes.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." [Ounces.]	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Tinctura Valerianæ.	Valerian.....	20	20. av.	6.12 (=6⅛) av., or 5 86 fl. Fl. Ext.	6. av.	6. av.
	Alcohol 2 / Water 1	15	16.1 fl.*	4.93 (=4 15-16) fl.	24.5 fl / 10. fl. } 5. fl	25 / 11 } 5. fl.
	Product.....	100	104.5 fl.	32. fl.	32. fl.	32. fl.
Tinct. Valer. Ammon.....	Valerian.....	20	20. av.	6.07 (=6 1-16) av., or 5 83 fl. Fl. Ext.	6. av.	6. av.
	Arom. Spt. Ammon ..	20	21.7 fl.	6.58 (6 9-16) fl.	6.5 fl.	6. fl.
	Product.....	100	105.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Vanillæ..	Vanilla	10	10. av.	3.32 (=3 5-16) av.	3.2 av.	3. av.
	Sugar.....	20	20. av.	6.64 (=6⅝) av.	6.4 av.	6. av.
	Alcohol 2 / Water 1 }	50	53.65 fl.*	16.04 (=16) fl.	17.36 fl.	16. fl.
	Product.....	100	96.3 fl.	32. fl.	32. fl.	32. fl.
Tinct. Veratrii Viridis.....	Veratrum Viride.....	50	50 av.	14.61 (=14⅝) av., or 14. fl. Fl. Ext.	14.54 av.	14. av.
	Alcohol.....	15	17.55 fl.	5.13 (=5⅛) fl.	5.09 fl	5. fl.
	Product.....	100	109.5 fl.	32. fl.	32. fl.	32. fl.
Tinctura Zingiberis. ..	Ginger....	20	20. av.	5.59 (=5⅝) av., or 5.37 fl. Fl. Ext.	5.64 av.	5.5 av.
	Alcohol.....	5	5.85 fl.	1.63 (=1⅝) fl.	1.65 fl.	1.5 fl.
	Product.....	100	114.5 fl.	32. fl.	32. fl.	32. fl.
Vinum Album Fortius	White Wine.....	7	6.72 fl.	27.57 (=27 9-16) fl.	27.54 fl.	27.5 fl.
	Alcohol.....	1	1.17 fl.	4.8 (=4 13-16) fl.	4.76 fl.	4.75 fl.
	Product.....	8	7 8 fl.	32. fl.	(32 fl.)	(32. fl.)
Vinum Aloes.....	Purified Aloes.....	6	6. av.	2. av.	2. av.	2. av.
	Cardamom.....	1	1. av.	0.33 av. = 146 gr.	0.33 av.	0 33 av.
	Ginger	1	1 av.	0.33 av. = 146 gr.	0.33 av.	0.33 av.
	Str. White Wine.....	90	87.3 fl.	29.1 fl.	29.33 fl.	26. fl.
	Product.....	100	96. ± fl.	32. fl.	32. fl.	32. fl.
Vinum Antimonii	Tartar Emetic....	4	4. av.	0.132 av. = 58 gr.	60 gr	58 gr.
	Boiling Dist. Water...	60	57.6 fl.	1.90 (=1⅞+) fl	2. fl.	2. fl.
	Str. White Wine.....	600	584. fl.	19.27 (=19¼) fl.	20 25 fl.	20. fl.
	Product....	1000	970. fl.	32. fl.	32. fl.	32. fl.
Vinum Aromaticum ..	Lavender.....	1	1. av.	0.33 av. = 146 gr.	146 gr.	144 gr.
	Origanum.....	1	1. av.	0 33 av. = 146 gr.	146 gr.	144 gr.
	Peppermint	1	1. av.	0 33 av. = 146 gr.	146 gr.	144 gr.
	Rosemary...	1	1 av.	0.33 av. = 146 gr.	146 gr.	144 gr.
	Sage..... ..	1	1. av.	0 33 av. = 146 gr.	146 gr.	144 gr.
	Wormwood.....	1	1 av.	0 33 av. = 146 gr.	146 gr.	144 gr.
	Str. White Wine.....	4	3.88 fl.	1.29 (=1 5-16) fl.	1.33 fl.	1.5 fl.
	Product..... ..	100	96. fl.	32. fl.	32. fl.	32. fl.
Vin. Colchici Rad.....	Colchicum root.....	40	40 av.	13.55 (=13 9-16) av.	13.33 av.	13. av.
	Str. White Wine.....	10	9.7 fl.	3.29 (=3 5-16) fl.	3.33 av.	4. fl.
	Product.....	100	95 5 fl.	32. fl.	32. fl.	32. fl.
Vin. Colchici Sem.	Colchicum seed.....	15	15. av.	5. av.	5. av.	5. av.
	Str. White Wine.....	90	86.4 fl.	28 8 (=28⅝) fl.	30. fl.	28. fl.
	Product.	100	96. fl.	32. fl.	32. fl.	32. fl.

* Alcohol 24.4, water 10 volumes.

NAME OF PREPARATION.	CONSTITUENTS.	Parts by Weight.	"Solids by Weight, Liquids by Measure." (Ounces.)	To Make Two Pints.	Working Formula National Disp.	Working Formula U. S. D.
Vinum Ergotæ..	Ergot....	15	15. av.	5. av.	5. av.	5. av.
	Str. White Wine.....	4	3.88 fl.	1.3 (=1 5-16) fl.	1.33 fl.	1.25 fl.
	Product..	100	96. fl.	32. fl.	32. fl.	32. fl.
Vin. Ferri Amarum..	Sol. Cit. Iron and Q..	8	6.15 fl.	2.22 (=2¼) fl.	2.13 fl.	2.125 fl.
	Tinct. Sw't Orange...	12	13.6 fl.	4 91 (=4 15-16) fl.	4.8 fl.	4. fl.
	Syrup	36	26.2 fl.	9.46 (=9½) fl	9.42 fl.	10. fl.
	Str. White Wine.. ...	44	42.7 fl.	15.42 (=15 7-16) fl.	15.44 fl.	16. fl.
	Product..... ...	100	88.7 fl.	32. fl.	32. fl.	32. fl.
Vin. Ferri Citratis...	Cit. Iron and Am.....	4	4. av.	1.33 (=1 5-16) av.	1.33 av.	1.336 av.
	Tinct. Sw't Orange...	12	13.6 fl.	4.53 (=4½) fl.	4.5 fl.	5. fl.
	Syrup....	12	8.73 fl.	2.91 (=2 15-16) fl.	3. fl.	3. fl.
	Str White Wine.....	72	69.9 fl.	23.3 (=23 5-16) fl.	24. fl.	23 fl.
	Product.....	100	96.3 fl.	32. fl.	32. fl.	32. fl.
Vinum Ipecacuanhæ..	Ipecac..	7	6.75± fl.	2 22 (=2¼) fl.	2 25 av.	2.5 fl.
	Str. White Wine.....	93	90.3 fl.	29.78 (=29¾) fl.	29.9 av.	30. fl.
	Product.....	100	97. ± fl.	32. fl.	32. fl.	32. ± fl.
Vinum Opii.....	Powdered Opium.....	10	10. av.	3.32 (=3 5-16) av.	3.37 av.	3 34 av.
	Cinnamon.	1	1 av.	0.33 av.=146 gr.	148 gr.	144 gr.
	Cloves.	1	1. av.	0.33 av.=146 gr.	148 gr.	144 gr.
	Str. White Wine.....	90	88.2 fl.	29.3 (=29¼) fl.	30.3 av.	28.8 fl.
	Product.	100	96. fl.	32. fl.	32. fl.	32. fl.
Vinum Rhei... .	Rhubarb..	10	10. av.	3.33 (=3 5-16) av.	3.37 av.	3.25 av.
	Calamus..	1	1. av.	0.33 av.=146 gr.	148 gr.	140 gr.
	Str. White Wine.....	5	4 9 fl.	1.63 (=1⅝) fl.	1.68 fl.	1.5 fl.
	Product.....	100	96. fl.	32. fl.	32. fl	32. fl

In concluding this paper, the writer desires to express his obligations to Mr. A. B. Stevens for supplying some of the practical data on which calculations have been based.

In Memoriam.

L. W. Cole, Petoskey.

L. S. Coman, Bay City.

L. W. Escott, Grand Rapids.

E. S. Hipkins, Blanchard.

E. L. Jones, Battle Creek.

J. F. Laubengayer, Owosso.

COPY OF THE ACT OF LEGISLATURE UNDER WHICH THE MICHIGAN STATE PHARMACEUTICAL ASSOCIATION WAS INCORPORATED, JULY 13, 1887.

LANSING, MICH., March 2, 1887.

SECTION 1. *The People of the State of Michigan enact*, That any hundred or more persons who shall be qualified pharmacists within the meaning of act No. 134 of the session laws of 1885, or who shall have received the diploma or degree of any school of pharmacy legally empowered to confer such diploma or degree, who may desire to become incorporated for the purposes set forth in the title of this bill, may execute under their hands, and acknowledge before some person within this State authorized to take acknowledgments of deeds, articles of agreement, which articles, as hereinafter specified, shall be filed and recorded in the office of the Secretary of State, and upon the execution and acknowledgment of such articles, the signers thereof and those who may thereafter become associated with them, shall become a body politic and corporate for the purposes set forth in said articles.

SECTION 2. The articles of such Association shall contain:

First, The names and residences of the persons associating in the first instance.

Second, The name of such corporation and the period for which it is incorporated, not exceeding thirty years.

Third, The object for which it is incorporated.

Fourth, The number, names and duties of its regular officers.

Fifth, The terms and conditions of membership therein: *Provided*, That the terms and conditions of membership in such Association, after the incorporation thereof, shall, at all times, conform to and be governed by the laws of this State, if any there may be regulating the practice of pharmacy.

SECTION 3. The affairs of such corporation shall be managed by an executive committee and officers of the Association, to be chosen for such period and in such manner as the by-laws of such Association shall provide, and who shall hold their offices until their successors are chosen and qualified. All members of such corporation, except honorary members, shall be residents of the State of Michigan.

SECTION 4. The corporation so formed may sue or be sued, take by gift, purchase or devise property exclusive of that actually used and necessary for the transaction of its business, to an amount not exceeding ten thousand dollars; and may invest or manage the same in the interests of said Association.

SECTION 5. It shall be the duty of the Secretary of any Association organized under the provisions of this act to compile a printed report of the transactions of said Association, including copies of papers read at its meetings, reports of facts collected, discoveries made, and experience gained, one copy of which said printed report shall be deposited in the office of the Secretary of State, one in the State library, one in the office of the State Board of Health, and at least one retained in the office of the Association.

SECTION 6. All amendments, changes, or modifications in the articles of agreement permitted by this act shall be filed and recorded in the office of the Secretary of State within sixty days after the adoption of the same by such Association.

CONSTITUTION AND BY-LAWS.

Adopted at Petoskey, Michigan, July 13, 1887.

PREAMBLE.

WHEREAS, Organization, concert of action, and comparison of ideas, are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore,

Resolved, That we, druggists of the State of Michigan, whose names are hereunto attached,* in compliance with an act entitled an act to organize the reputable pharmacists of the State of Michigan into an association to be known as the Michigan Pharmaceutical Association, approved April, 1887, do hereby organize ourselves into such Association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The object of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard, and, ultimately, to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.

MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry, and botany, who may be specially interested in pharmacy, shall be eligible to membership.

*The names signed to this document are those indicated in the roll of members by an asterisk.

ARTICLE IV.

OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected by ballot at the third sitting of the regular annual meeting of the Association, and to serve until their successors are elected.

ARTICLE V.

DUTIES OF OFFICERS.

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, until the close of such meeting; call special meetings at the written request of twenty-five members; fill all vacancies that may occur in the offices of the Association between the annual meetings; shall present at each meeting a report of the Association, and perform such other duties as pertain to the office.

SECTION 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election, and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all moneys for dues, and from all other sources, giving receipts for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee. He shall file a copy of the proceed-

ings of each annual meeting in the office of the State Board of Health, and of the Secretary of State, and shall keep at least three copies in his own office.

SECTION 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

SECTION 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association committed to their care.

SECTION 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.

MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.

BY-LAWS.

This Association may establish for its future government and regulation, such By-Laws, not in conflict with this Constitution, as may be deemed proper and desirable.

ARTICLE VIII.

AMENDMENTS.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.

QUORUM.

Twelve members shall constitute a quorum.

ARTICLE II.

MEMBERSHIP.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented to the Association in writing, signed by two members in good standing, and shall be referred to the Executive Committee, and if favorably reported by that committee, the candidate may be balloted for at once. A vote of two-thirds of the members present shall be required for an election.

ARTICLE III.

FEES.

The initiation fee of this Association shall be one dollar, which fee shall be paid to the Secretary.

ARTICLE IV.

DUES.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.

CERTIFICATE OF MEMBERSHIP

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.

COMMITTEES.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he

shall be an ex-officio member), each to consist of three members, viz: Committee on Trade Interests; Committee on Pharmacy and Queries; Committee on Legislation; Committee on Adulterations.

SECTION 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.

SECTION 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable, to be reported upon at the next annual meeting.

SECTION 4. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.

SUSPENSIONS—AMENDMENTS.

SECTION 1. These By-Laws shall not be suspended without the consent of two-thirds of the members present.

SECTION 2. Any amendment to these By-laws must be made in writing, and read before the Association, at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these By-Laws.

ARTICLE VIII.

DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meetings of the American Pharmaceutical Association.

ARTICLE IX.

PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees and members, shall be published annually under the supervision of an editor, who shall be elected annually and who shall be paid from the funds of the Association, and a copy of the proceedings shall be sent to each member of the Association less than two years in arrears.

ARTICLE X.

EXPULSION OF MEMBERS.

Any member or officer accused of violating the Constitution or By-Laws, or of other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting. In every case, definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the charges, and notify him in writing, at least two weeks in advance, of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense.

ARTICLE XI.

EXHIBITS.

The Association invites manufacturers and others to exhibit at the annual meetings, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.

RULES OF ORDER.—ORDER OF BUSINESS.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SECTION 2. The order of business shall be such as the Executive Committee shall prescribe.

AMENDMENT TO THE PHARMACY ACT.

ADOPTED 1887.

SECTION 1. *The People of the State of Michigan enact,* That section ten* of act one hundred and thirty-four of the public acts of eighteen hundred and eighty-five, entitled "An act to regulate the practice of pharmacy in the State of Michigan," be and the same is hereby amended so as to read as follows:

SECTION 10. Nothing in this act shall apply to, or in any manner interfere with, the business of any practising physician who does not keep open shop for retailing, dispensing or compounding of medicine and poison, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the vending of patent or proprietary medicines by any retail dealer, *who has been in such business three years or more,* nor with the selling by any person of drugs, medicines, chemicals, essential oils and tinctures, which are put up in bottles, boxes, packages, bearing labels, securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons, three months, six months, one year, three years, five years, ten years, fifteen years and twenty-one years of age, and, if a poison, the name or names of the most common antidotes; of copperas, borax, blue vitriol, saltpeter, pepper, sulphur, brimstone, Paris green, licorice, sage, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerine, Glauber salts, epsom salts, cream tartar, bi-carbonate of soda, sugar of lead, and such acids as are used in coloring and tanning, nor with the selling of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, laudanum, quinine, and all other preparations of cinchona bark, tincture of aconite, and tincture of iron, compound cathartic pills, or quinine pills, when such cathartic or quinine

* See proceedings of last year, p. 209.

pills are compounded by and put up in bottles or boxes bearing the label of a registered pharmacist, with the name of the article and directions for its use on each bottle or box, nor with the exclusively wholesale business of any dealer: *Provided*, That every person who shall, within three months after this act takes effect, forward to the board of pharmacy, satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State, in the preparation of physicians' prescriptions, three years next previous to the second day of June, 1885, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist.

EXTRACTS FROM MICHIGAN LIQUOR LAW, APPROVED JUNE 28, 1887.

SECTION 1. *The People of the State of Michigan enact*, That in all townships, cities and villages of this State there shall be paid annually the following tax upon the business of manufacturing, selling or keeping for sale, by all persons whose business, in whole or in part, consists in selling or keeping for sale, or manufacturing distilled or brewed or malt liquors or mixed liquors, as follows: Upon the business of selling or offering for sale spirituous or intoxicating liquors, or mixed liquors by retail, or any mixture or compound, excepting proprietary patent medicines, which in whole or in part consist of spirituous or intoxicating liquors, and any malt, brewed, or fermented liquors, five hundred dollars per annum; upon the business of selling only brewed or malt liquors at wholesale or retail, or at wholesale and retail, three hundred dollars per annum; upon the business of selling spirituous or intoxicating liquors at wholesale, five hundred dollars; or at wholesale and retail, eight hundred dollars per annum.

SEC. 3. The penal provisions of this act shall not apply to druggists who sell liquors for chemical, scientific, medicinal, mechanical or sacramental purposes only, and in strict compliance with law. It shall not be lawful for any druggist, nor for any person whose business consists in whole or in part of the sale of drugs and medicines, directly or indirectly, by himself, his clerk, agent or servant, at any time, to sell, furnish, give, or deliver, any spirituous, malt, brewed, fermented, or vinous liquor, or any mixed liquor, a part of which is spirituous, malt, brewed, fermented or vinous, to a minor, except for medicinal or mechanical purposes, on the written order of the parent or guardian of such minor, nor to any adult person whatever, who is at the time intoxicated, nor to any person in the habit of getting intoxicated, nor to any Indian, or any person of Indian descent, nor to any person when forbidden in writing so to do by the husband, wife, parent, child, guardian, or employer of such person, or by the supervisor of the township, or mayor, or director of the poor, or any supervisor or alderman of the city, or president or trustee of any village or superintendent of the poor of the county in which such person shall reside or temporarily remain, nor to any other person to be used as a beverage, nor to any person to be drank on the premises, nor to be mixed and drank with any beverage drawn from a soda fountain or other apparatus or device for dispensing aerated or other beverages; but such druggist shall be allowed to sell said liquors for medicinal, chemical, scientific, mechanical and sacramental purposes only, without the payment of any tax specified in section one, and subject to the following restrictions and conditions: Every such dealer in drugs and medicines shall procure and keep a suitable blank book in which shall be recorded by said druggist, his clerk or employé the names of all persons applying for such liquor for any of these lawful purposes, the date of each sale, the amount and kind of liquor sold to each person, and the purpose to which the same was to be applied, as stated by the purchaser, which book shall be kept in the store of said druggist, and shall be open to all persons for examination during all business hours; and the failure to keep a record of every such sale, in manner and form as aforesaid, or the delivery of liquor for any purpose

other than above named, shall subject such druggist to the penalties provided for in this section: *Provided*, That such druggist shall, on or before the first day of May in each year, or before commencing business, execute and file with the county treasurer of the county in which he is carrying on such business, a bond, the sufficiency of which shall be determined by the township board of the township, or the board of trustees, or the common council of the village or city in which such business is proposed to be carried on, to the people of the State of Michigan, in the sum of two thousand dollars, with two or more sufficient sureties, who shall be freeholders and residents of the county in which such business is proposed to be carried on, each of whom shall justify in a sum equal to the amount of the bond, over and above all indebtedness and all exemptions from sale on execution, and all liability on other similar bonds, which bond shall be substantially in the following form:

Know all men by these presents, that we..... as principal and.....and..... as sureties, are held and firmly bound unto the people of the State of Michigan in the sum of two thousand dollars, to the payment whereof, well and truly to be made, we bind ourselves, our heirs, executors, and administrators firmly by these presents. Sealed with our seals and dated this.....day of.....18....

WHEREAS, The above named principal proposes to carry on the business of a druggist at....., in the county of ....., and State of Michigan;

AND WHEREAS, The said principal hath covenanted and agreed, and doth hereby covenant and agree as follows, to-wit: That he will not directly or indirectly, by himself, his clerk, agent, or servant, at any time, sell, furnish, give, or deliver any spirituous, malt, brewed, fermented or vinous liquor, or any mixed liquor, a part of which is spirituous, malt, brewed, fermented or vinous, to a minor, except for medicinal or mechanical purposes, on the written order of the parent or guardian of such minor, nor to any adult person whatever, who is at the time intoxicated, nor to any person in the habit of getting intoxicated, nor to any Indian, or any person of Indian descent, nor

to any person when forbidden in writing so to do by the husband, wife, parent, child, guardian, or employer of such person, or by the supervisor of the township, mayor or director of the poor of the city, or superintendent of the poor of the county in which such person shall reside or temporarily remain, and that he will not sell any such liquor to be drank on the premises, nor to be mixed and drank with any beverage drawn from a soda fountain or other apparatus or device for dispensing aerated or other beverages; that he will sell such liquors for chemical, scientific, medicinal, mechanical and sacramental purposes only, and that he will pay all damages, actual and exemplary, that may be adjudged to any person or persons for injuries inflicted upon him or them, either in person or property, or means of support, or otherwise by reason of his selling, furnishing, giving or delivering any such liquors. Now the condition of this obligation is such that if said principal shall well and truly keep and perform all and singular the foregoing covenants and agreements, and shall pay any judgment for actual or exemplary damages which may be recovered against him in any court of competent jurisdiction, and all fines and costs that may be imposed upon him for violations of this act, then this obligation shall be void and of no effect, otherwise the same shall be in full force and effect.

Signed and sealed in the presence of

.... [L.S.]
.... [L.S.]
..... [L.S.]

Whenever any druggist shall violate any of the provisions of this section, he shall, on conviction thereof, be deemed guilty of a misdemeanor, and be punished by a fine of not less than one hundred nor more than five hundred dollars, and costs of prosecution, or imprisonment in the county jail not less than ninety days nor more than one year, or both such fine and imprisonment, in the discretion of the court; for a second violation of any of the provisions of this act, such druggist shall, in addition to the penalty hereinbefore provided for, be debarred from selling in this State any of the liquors hereinbefore mentioned,

for a period of five years from and after the date of such conviction, and it shall be set forth and declared in the record of judgment upon such second conviction: *Provided*, That every drug clerk shall be responsible for violating the provisions of this act, for his personal act or violation, and be subject to the same penalties as proprietors or employers.

SEC. 30. The provisions of this act shall not be so construed as to prevent druggists, physicians and persons engaged in the mechanical arts from compounding liquors for medicinal and mechanical purposes.

FROM LOCAL OPTION ACT, APPROVED JUNE 18, 1887.

SECTION 3. In any county in this State in which the electors of such county, as hereinbefore provided, have voted to prohibit the manufacture and sale of such liquors by a majority vote, then in such case the provisions of the general laws of this State for the taxation and regulation of the business of the sale, manufacture or dealing in such liquors is suspended, or superseded, from and after the first day of May next following, so far as relates to the territory of such county, and all sales made by druggists in such county shall be under all the restrictions imposed upon druggists by said general laws of this State.

ROLL OF MEMBERS.

☞ Members whose names are marked with an asterisk were present at the fifth annual meeting.

*Adams, C. H.	Otsego	1884
Adamson, J. W.	Holly	1885
Ahlborn, Augustus	Detroit, 718 Michigan Ave.	1885
Akey, J. V.	Colon	1885
Aldworth, F. G.	Grand Rapids	1884
Allen, A. W.	Detroit, 410 G'd River Ave.	1883
Allen, Earl	Stanton	1887
Allen, E. F.	Boyne City	1885
Alsdorf, F. M.	Lansing	1883
Amberg, Isaac	Battle Creek	1886
Anderson, Ellery	Midland	1884
Anderson, Maxon	Midland	1884
Andrews, S. N.	Flint	1884
Andrus, C. S.	Detroit, 1151 Jefferson Ave.	1885
Andrus, E. J.	Utica	1886
Arbour, Henry	Muir	1884
Arbour, M. T.	Orangeville Mills	1884
Arnold, W. C.	Ludington	1885
Arthur, Hiram	Dowagiac	1887
Atwater, C. H.	Lapeer	1884
Baar, Henry	Grand Haven	1885
Babbington, John	Corunna	1884
Bachman, M. H.	Stanton	1883
Bahel, C. W.	Otsego Lake	1884
Baier, C. G.	Detroit, 326 Gratiot Ave.	1883
Bailey, G. H.	Elk Rapids	1885
Bailey, Morrison	Plainwell	1886
Baker, Dennis	Grand Rapids, 89 Monroe Ave	1885

Baker, W. H	Whitehall	1885
Baldwin, E. L	Ludington	1884
Bangs, W. Z	Holland	1885
Banks, A. W	Detroit	1883
Bannard, H. F	Nashville, Tenn	1883
*Barber, M. A	Petoskey	1887
Barbour, F. S	Clifford	1884
Barbour, W. G	Linden	1885
Barbarin, G. F	Freeland	1885
Barker, W. J	Hart	1886
Barie, H. L	Detroit	1887
Barrows, J. F	Lawrence	1885
Bartram, E. W	Paw Paw	1883
*Bassett, A	Detroit, 95 Woodward Ave	1884
Bassett, E. C	South Lyon	1884
*Bassett, J. A	Detroit, (J. E. Davis & Co.)	1885
Bauer, A. C	Grand Rapids	1884
Baxter, T. H	Grand Rapids	1884
Beach, L. T	Bay City	1884
Beachum, C. B	Romeo	1884
Beaman, G. W	East Jordan	1886
Beck, W. H	Detroit	1887
Beebe, Hosmer	Eaton Rapids	1883
Belsher, W. E	East Saginaw	1884
Bence, G. W	Detroit	1885
Bennett, J. R	Menominee	1884
Bennett, L. T. E	Port Huron	1885
Bertram, Julius	Alpena	1884
Bertram, J. P	Westphalia	1883
Bessac, H. B	Milan	1883
Bigelow, C. P	Big Rapids	1884
Bigelow, W. H	Owosso	1884
Bigg, A. H	Detroit, 255 St. Aubin Ave	1884
Bird, C. E	Saugatuck	1884
Bird, Jr., Henry	Douglas	1884
Birge, W. E	Kalamazoo	1884
Bisbee, A. B	Benton Harbor	1885
Blacklay, T. L	Jones	1884

Blackmer, H. A.	Charlotte	1884
Blair, C. A.	Morenci	1885
Blakeslee, L. G.	Detroit, 177 Griswold St	1885
Blakeslee, N. P.	Elmira	1886
Blocher, Charles	Millington	1885
*Boehnlein, George	Detroit (F., W. & Co.)	1886
Bolio, Oliver	Detroit, Michigan Ave	1884
Bond, E. C.	Muskegon	1885
*Bostick, J. C.	Manton	1887
Botsford, E. S.	Dorr	1886
*Bower, J. E.	Crystal Falls	1887
Bower, Manley	Clarkston	1883
Braddock, O. L.	South Bay City	1885
*Brackett, F. E.	Cheboygan	1887
Bridgeman, M. L.	Menominee	1884
Briggs, J. W.	Schoolcraft	1883
Bristol, F. E.	Lapeer	1884
Bristol, U. D.	Lapeer	1884
Brooks, Charles	Jackson	1884
Brown, D. D.	Kalamazoo	1885
*Brown, H. J.	Ann Arbor	1883
Brown, I. V.	Galesburg	1883
*Brown, J. J.	Okemos	1883
Browning, G. B.	Decatur	1885
Brundage, Fred	Muskegon	1886
Bruske R.	East Saginaw	1885
Buchanan, B. F.	Harrisville	1883
Buchanan, S. C.	Harrisville	1885
*Bugbee, C. A.	Cheboygan	1885
Bullard, E. A.	Vassar	1883
Bullock, S. V.	Howard City	1884
Burdick, H. H.	Bay City	1884
Burroughs, C. S.	Clinton	1884
Burwell, R. G.	Fort Gratiot	1884
Cady, G. F.	Hart	1883
Cahalan, J. C.	Wyandotte	1884
Caldwell, G. G.	Buchanan	1885

*Caldwell, J. W.	Detroit, 242 G'd River Ave.	1884
*Calkins, S. B.	Petoskey	1885
*Cameron Alexander.	Walton	1885
*Carney, M. S.	Dowagiac	1885
Carpenter, A. D	Mancelona	1885
Carrier, Hubert	Bay City	1884
Carroll, M. A.	Ludington	1885
Carroll, Watson.	Ludington	1885
Case, George N	Cheboygan	1887
Chamberlain, G. T.	Hartford	1883
*Chamberlain, M.	Horton	1884
Champney, W. R.	Detroit, 27 Lafayette Ave.	1883
Chandler, C. A.	Cambria Mills	1884
*Chapple, L. D	Wayland	1886
Church, H. M.	Holly	1884
Clark, A. G.	White Cloud	1883
Clark, J. K.	Blissfield	1884
Clark, Louis K	Elsie	1884
Clark, S. U.	Grand Rapids	1885
Clark, W. O.	Middleville	1884
Clarke, J. F.	Climax	1884
Clarke, W. G.	Detroit, 388 Baker St.	1885
Claxton, W. C.	Detroit, 27 Charles St.	1885
Cleland, Henry	Detroit, 79 Montcalm St. W.	1885
Cleveland, H. W.	Nunica	1884
Close, Orrin E	Spring Lake	1887
Coe, T. D.	Romeo	1884
Coffin, C. L	Detroit, 1087 Jefferson Ave.	1885
Cole, W. W.	Morenci	1885
Coleman, G. E.	Cadillac	1885
Coleman, H. G	Kalamazoo	1884
Colwell, C. B	Jackson	1886
Conley, E. V.	Stephenson	1883
Connine, Dewitt.	Wexford	1885
Connell, F. G. L.	Detroit, 55 Montcalm St.	1884
*Conrad, J. F	Otsego	1886
Conway, V. R.	Sault Ste. Marie	1885
Cook, C. E.	Durand	1884

Cooper, D. M.	Detroit, 371 Woodward Ave.	1884
Cooper, I. S.	Cheboygan	1885
Cornell, E. A.	Thedford, Ont	1885
*Cosford, J. W.	Mancelona	1887
Couturier, Noel	Provemont	1885
Covert, C. F.	Paw Paw	1883
Crane, Geo. W.	Cheboygan	1886
*Crawford, J. B.	Ithaca	1885
*Crispe, John	Plainwell	1886
Crookston, J. A.	Grand Rapids	1886
Cross, F. E.	Grand Rapids, 453 S. Div. St.	1885
*Crouter, G. W.	Charlevoix	1883
*Crowley, J. J.	Detroit, 421 Michigan Ave.	1884
Culver, R. W.	South Haven	1886
Curran, E. S.	St. Joseph	1883
Currie, A. A.	St. Clair	1885
Curtis, C. A.	Petoskey	1885
Curtis, F. E.	Napoleon	1885
Cutler, W. R.	Ionia	1883
Cushman, H. D.	Three Rivers	1884
Cummer, R. J.	Cadillac	1884
Dahm, A. C.	Mt. Clemens	1884
Damon, J. A.	Millington	1884
Davie, R. P.	Flushing	1886
Davis, F. S.	Ypsilanti	1885
Davis, G. L.	Lansing	1883
Davis, James E.	Detroit, 29 to 37 Larned, W.	1884
*Dayton, A. J.	Petoskey	1887
*Dean, H. M.	Niles	1887
DeBoe, John	Grand Rapids	1884
Deitz, G. A.	Cadillac	1883
Demorest, W. M.	Webberville	1884
Dewey, C. C.	Napoleon	1885
Dickinson, O. B.	Grand Rapids	1884
Dillon, James E.	East Tawas	1887
Dimick, S. H.	Ypsilanti	1884

Dodd, I. LeRoy H.	Buchanan	1883
Dodds, J. J.	Detroit, 51 and 53 Shelby St.	1883
Dodds, W. H.	Detroit, (J. J. Dodds & Co.)	1884
Dodge, E. L.	Montague	1885
Dorrance, A. A.	Coldwater	1883
Dunbar, R. H.	Parma	1885
Dunham, E. W.	Grand Rapids	1886
Dunlap, Thomas	South Lyon	1884
*Dunlop, J. W.	Clare	1883
Dunn, G. B.	Burr Oak	1885
Dunning, N. A.	Mason	1885
*Dupont, Wm.	Detroit, 182 Michigan Ave.	1883
Eaton, H. H.	Boyne Falls	1887
*Eberbach, O.	Ann Arbor	1883
Eckerman, A.	Muskegon	1884
Eldred, B. C.	Chesaning	1885
Elliott, R. H.	Pontiac	1885
Empey, M. C.	South Bay City	1884
Emster, F. H. J. van	Bay City	1885
Erskine, James	Rogers City	1885
Erwin, M. J.	Harbor Springs	1887
Escott, F. H.	Grand Rapids	1884
Everhart, James	Wacousta	1885
Fairchild, H. B	Grand Rapids	1886
Falk, W. B.	Howard City	1885
Fales, F. R.	Metamora	1884
Farnham, E.	Casnovia	1885
Farrand, J. S.	Detroit, (F., W. & Co.)	1884
*Fasquelle, L. J.	St. Johns	1885
Fatin, C. A.	Almont,	1885
*Federer, E. C.	Detroit, (F., W. & Co.)	1886
Fehlig, H. J.	Wyandotte	1884
Feldman, Henry	Sault St. Marie	1885

Fellows, C. A.	Big Rapids	1884
*Fenton, A. W.	Bailey	1886
Fenton, George L.	Kingsley	1885
Fildue, A. S.	St. Johns	1884
*Fincher, F. W.	Pentwater	1883
Fink, Leon C.	Detroit, (Parke, Davis & Co)	1884
*Fisher, James	Marlette	1887
Fisk, C. A. E.	Mancelona	1885
*Foote, C. E.	Jackson	1886
Foot, Wm. H.	East Saginaw	1884
*Fordham, M.	Elmira	1885
Fordham, W. W.	Traverse City	1884
Foster, A. R.	Otsego, Allegan Co.	1886
Foster, W.	East Tawas	1884
Fournier, Lucien	Bay City	1884
Fox, J. R.	Cedar Springs	1886
Frank, H. A.	Detroit, 291 Congress Street	1883
*Francis, A. B.	Olivet	1887
Fritz, T. H.	Cass City	1885
Frizelle, C. L.	Detroit, 26 Mich. Ave.	1884
Frizelle, S. F.	Detroit, 26 Mich. Av.	1884
Fulton, Robert	Detroit, 375 Baker St.	1884
Fuqua, C. B.	Big Rapids	1884
Gahan, D. J.	Mt. Pleasant	1884
Gallinger, E. L.	Cadillac	1885
Gardner, A. R.	Fowlerville	1884
Gates, E. M.	———	1885
Gates, T. O.	East Tawas	1884
Geary, S. M.	Maple Hill	1886
Gebb, John A.	Benton Harbor	1887
Gebhard, A. E.	Muskegon	1883
Gerow, J. E.	Ovid	1883
Gibbs, N. C.	Big Rapids	1884
Gill, W. J.	Beacon	1884
Gladding, B. O	Constantine	1883
Glazier, F. P.	Chelsea	1885

Gleason, E. G.	Richmond	1884
Goldsmith G. S.	Manistee	1885
Goodrich, L. C.	Kalkaska	1883
Goodrich, L. A.	Hillsdale	1884
Goodsill, A. A.	Jasper	1884
Goodyear, J. J.	Ann Arbor	1883
Goodyear, W. H.	Hastings	1885
Gorsuch, C. H.	Waldron	1885
Gover, G. H.	Leaton	1884
Grandy, Francis	Fairfield	1885
*Grandy, M. A.	Sault Ste. Marie	1887
Graydon, G. H.	Detroit, (J. J. Dodds & Co.)	1885
Greene, A. L.	Lafayette, Ind	1883
Gregory, A. W. C.	Albion	1884
*Griffith, W. F.	Howell	1883
Grommon, P. D.	———	1885
Grosse, W. F.	———	1885
Grunow, O. H.	Detroit, 182 Gratiot Ave.	1884
*Gundrum, George	Ionia	1883
Haan, G. T.	Grand Rapids	1884
*Hackett, P. E.	Wolverine	1886
Haenssler, G. J.	Manchester	1885
Hagerman, F.	Birmingham	1886
Haight, A. L.	Woodland	1886
Hale, H. G.	Nashville	1883
Hall, J. L.	Chatham, Ont.	1885
Hall, J. W.	Hudson	1884
Hall, W. A.	Greenville	1884
Halladay, O. A.	Hoylsville	1886
Haller, J. P.	Sault Ste. Marie	1885
Hallock, D. G.	Detroit, 764 Fort St. West	1884
Halsey, L. J.	Utica	1884
Hamilton, E. A.	White Pigeon	1886
Hamilton, H. G.	East Saginaw	1884
Hamlen, R. J.	Detroit, 813 Gratiot Ave.	1885
*Hanlon, Amos	Elk Rapids	1884

Happy, Charles	Maybee	1885
*Harper, J. C	Milan	1884
Harris, D. S	Central City, Dakota	1884
Harris, J. M	Ironton	1887
Harrison, B. D	Barron, Wis.,	1885
Harrison, D. A	Paw Paw	1884
Harrison, H. E	Richmond	1884
Harshaw, W. D	Pontiac	1885
Hartz, H. T	Detroit, 81 Woodward Ave	1884
Harvey, E. C. T	Port Huron	1885
Harvey, H. D	Bangor	1883
Harvey, S. K	Detroit, (T. H. H. & Sons)	1884
Harvey, T	Farmers	1884
*Harwood, G. M	Petoskey	1884
*Harwood, Henry	Ishpeming	1885
*Hastings, R. A	Sparta	1884
Hawkins, Henry	Detroit, 518 Hastings St	1883
Haynes, D. O	Detroit, 835 Jefferson Ave	1886
Hazeltine, A. F	Grand Rapids	1886
Heath, Fred	Hastings	1884
Hedges, H. C	North Lansing	1884
Heimbach, S. J	Constantine	1884
Hendrick, F. H	Stanton	1883
Herley, M. L	East Saginaw	1883
Herrington, C. H	Belleville	1884
Herrington, J. A	Belleville	1884
Hessler, Will	Rockford	1884
*Hewett, J. S	Milford	1884
Hewett, L. E	Lansing	1883
Heysett, William	Ludington	1885
Hibbard, Frank	———	1884
*Hicks, W. H	Morley	1883
Hicks, W. L	St. Johns	1885
Higgins, D. W	Scottville	1884
Hinchman, C. C	Detroit, (T. H. H. & Sons)	1885
Hinds, E. J	Midland	1886
Hitchcock, W. A	Manistee	1885
Hogeboom, J. G	Saginaw	1884

Hoggner, F. F. W.	Detroit	1884
Hogle, J. L.	Farmington	1884
Holt, A. E.	Detroit, 415 Woodward Ave.	1885
Hopkins, I. F.	Muskegon	1884
Horner, D. A.	Caro	1884
Hotchkiss, F.	Hastings	1884
Houp, Frank	Detroit, 328 Michigan Ave.	1884
Howard, Charles	Alpena	1885
Howard, W. S.	St. Joseph	1885
*Hower, Nelson	Mendon	1885
Hueston, G. C.	Northville	1885
*Hull, C. W.	Bay City	1887
Hullinger, James	Big Rapids	1883
*Hutton, R. J.	Detroit, 425 Antoine St.	1885
Humphrey, C. E.	Jackson	1883
Hungerford, C. B.	Northville	1885
Hunt, A. O.	St. Johns	1885
Hunt, F. J.	Detroit, 12 McLean St.	1886
Hunter, J. E.	———	1884
Hutchings, Wm.	Leslie	1884
Hutty, F. A.	Grand Haven	1886
Hurd, A. E.	Davison Station	1884
Hurd, C. W.	Davison Station	1885
Hurd, J. E.	Detroit, 208 Woodward Ave.	1884
Hyde, A. O.	Marshall	1883
Hyde, H. J.	Marshall	1884
Hynes, Quincy	Hastings	1885

*Inglis, Frank	Detroit, 177 Griswold St.	1883
Ingram, E. J.	Iron Mountain	1883

Jamison, T. A.	South Boardman	1886
Jefts, Willard	Big Rapids	1884
*Jesson, Jacob	Muskegon	1883
Johnson, C. B.	Palo	1885
*Johnson, J. G.	Traverse City	1884

Johnson, O. C.....Ann Arbor.....1884
Johnston, A. J.....Detroit, 271 Gratiot Ave.....1885
Johnston, A. M.....Toronto, Canada.....1885
Johnston, William.....Detroit.....1884
Johnston, W. S.....Detroit, 271 Gratiot Ave....1884
Joslen, O. C.....St. Johns.....1884
Judson, F. E.....Brighton.....1883

Kay, G. A.....Detroit, 95 Woodward Ave..1885
Kay, W. J.....Belmore, Ontario, ...1884
Keeler, W. H.....Saginaw.....1883
Kellogg, A. F.....Cedar Lake.....1886
*Kellogg, C. E.....Grand Rapids.....1887
Kellogg, J. H.....East Saginaw.....1884
Kellogg, J. L.....East Saginaw 1885
Kelley, David, ...Lyons.....1885
Kelly, F. H.....Au Sable.....1884
Kelsey, F. E.....Ionia.....1886
Kemink, Theo.....Grand Rapids.....1884
Kennedy, T. B.....Commerce.....1886
Kennedy, E. J.....Detroit, 709 Woodward Ave.1884
Kenrick, E. H.....Hillsdale.....1884
Kenyon, W. W.....Howell 1884
*Kephart, H.....Berrien Springs.....1883
Kephart, W .....Berrien Springs.....1884
*Kestell, J. R.....Detroit, 695 Beaubien St....1887
Kibbee, A. D.....Custer.....1884
Kidd, A. J.....Benton Harbor.....1885
Kimball, S. L .....Crystal Falls.....1884
Kimm, D.....Grand Rapids.....1886
Kimm, M. B.....Grand Rapids.....1886
*Kinmont, B. F.....Tekonsha.....1884
Kinsel, Wm. S.....Detroit, 82 Bagley Ave.....1886
Kipp, F. E.....Grand Rapids.....1884
Kirkwood, C. H.....Ishpeming.....1884
Kirkwood, P. B.....Negaunee.....1885
*Kirtland, J. W.....Lakeview 1885

*Klingman, Theophil	Dexter	1885
Koon, C. S.	Muskegon	1885
Kotcher, C. W.	Detroit, 153 G'd River Ave.	1884
Lacy, E. M.	Sault Ste. Marie	1884
Lane, I. D.	Sand Beach	1884
La Rue, C. M.	West Bay City	1885
Lambert, B. L.	Detroit (J. J. Dodds & Co.)	1884
*Lamoreux, John	Lakeview	1884
*Lamoreux, Sarah A.	Lakeview	1884
*Latimer, F. N.	Ludington	1883
Latimer, R. L.	Jackson	1884
Laubengayer, T. A.	Owosso	1884
Leasia, J. N.	Williamston	1885
Lee, A. B.	Detroit, 453 G'd River Ave.	1884
Lee, E. D.	Ludington	1885
Lee, John	Dexter	1885
*Le Fevre, G. L.	Muskegon	1885
Leggett, I. J.	Paris	1887
Leland, N. P.	Gaines	1886
Lentz, Theodor	Detroit, Campbell Ave.	1885
Leonard, H.	Muskegon	1884
Leuschner, Richard	Detroit, 148 Randolph St.	1884
Lever, Henry	Newaygo	1884
Litchfield, E. C.	Flint	1885
Little, A. F.	Spencer Creek	1885
Lobdell, J. H.	Flat Rock	1884
Locher, H. E.	Grand Rapids	1885
Long, B. W.	Portland	1884
Long, G. L.	Detroit, 115 Michigan Ave.	1885
Longwell, E. B.	Paw Paw	1884
Longwell, H. D.	Paw Paw	1885
Lonsbury, J. H.	Reed City	1886
Lonsbury, P. M.	Reed City	1885
Luce, Jr., W. O.	Caro	1885
Lunn, G. D.	Vestaburg	1885
Lusk, George L.	Owosso	1886
*Lyman, A. H.	Manistee	1883
*Lyons, A. B.	Detroit, 423 Second Street	1884

MacKimmie, J. A.....Detroit, 723 Fort St. West..1884
Madill, Thomas.....Detroit, 120 Henry St.....1884
Mahon, F. M.....Oscoda.....1885
Malmgren, Gustav A.....Ishpeming.....1887
*Mann, Albert.....Ann Arbor.....1883
Mandigo, Della.....Sherwood.....1886
Mandigo, W. R.....Sherwood.....1884
Mason, C. A.....Flint.....1885
*Mason, G. B.....Saline.....1883
Marr, T. W.....Detroit, 333 Woodward Ave..1885
*Martin, A. F.....Imlay City.....1884
Martin, C. L.....Elk Rapids.....1884
Martin, Henry.....Jackson.....1884
Martin, Susie A.....Pierson.....1885
Marty, F. O.....Manchester.....1887
Martyn, W. J.....May.....1885
Mayer, F. W.....Sebawaing.....1884
Maynard, T. C.....Gagetown.....1884
Maxson, M. M.....Hudson.....1885
McCoy, W. B.....Ironwood.....1885
McCrae, H. F.....Detroit.....1885
*McDonald, David.....Kalamazoo.....1884
McDonald, D. T.....Red Jacket.....1883
*McDonald, George.....Kalamazoo.....1883
McDonald, Murdo.....St. Johns.....1885
McEvoy, J. E.....Manistee.....1885
McFarland, A.....Detroit, 693 Michigan Ave..1883
McFarland, Wm.....Detroit, 506 Michigan Ave..1884
McInnes, M. V.....———.....1885
McHenry, G. A.....Chippewa Lake.....1886
McKenna, J. D.....Salt River.....1884
McLean, C. E.....Jackson.....1885
McMillan, Neal.....Rockford.....1887
McMullen, G. H.....Ionia.....1883
McNeal, Byron.....Byron Center.....1886
*McPhee, J. A.....Evart.....1887
McQueen, E. F.....Detroit.....1884
Mead, H. L.....Escanaba.....1884
Mead, J. N.....Escanaba.....1883

Merrell, F. P.	Ithaca	1883
Merrell, M. C.	Webberville	1883
*Merrill, A. C.	Cross Village	1887
Merriam, C. K.	Custer	1883
Meseroll, D. C.	Jackson	1884
Mesick, H. J.	Plainwell	1886
Meyers, John	Mt. Clemens	1883
Meyers, J. K.	Muskegon	1885
*Middleton, V. H.	Grand Rapids	1884
Miles, J. B.	Dexter	1884
Miller, C. N.	Dryden	1884
Miller, H. J.	Fort Gratiot	1885
Miller, N.	Fremont	1886
Millikin, T. J.	St. Clair	1884
Millington, F. S.	Paw Paw	1883
Mills, L. M.	Grand Rapids	1886
Milner, C. H.	Big Rapids	1886
Millspaugh, G. D.	Albion	1883
Moore, John	Ann Arbor	1884
Moore, W. B	East Saginaw	1884
Moorland, Charles.	Hadley	1885
*Morford, A. D.	Ypsilanti	1884
Morrison, A. W.	Constantine	1885
Morrison, Thomas.	Wayne	1885
Mottram, J. H. H.	Detroit (J. E. D. & Co)	1883
Mueller, J. C.	Detroit, 120 Woodward Ave.	1883
Muir, J. D.	Grand Rapids	1886
Mulloy, Wm.	Minden	1884
Murphy, J. W.	Battle Creek	1883
Myers, A. W.	Gobleville	1884
Neff, H. C.	Detroit, 723 Fort St.	1884
Nelson, E. H.	Detroit (F. Stearns & Co)	1884
Nelson, Pascal P.	Northport	1887
Newell, C. P.	Richmond	1884
Newman, E. P.	Lansing	1885

Noble, M. L.....Sparta.....1885
*Noel, Gideon.....Good Hart, Emmet Co.....1884
North, S. J.....Grand Rapids.....1885
Northrup, B. D.....North Lansing.....1883
Norris, J. L.....Casnovia.....1886
Nowell, W. S.....Laingsburg.....1884
Noyes, K. W.....Paw Paw.....1886
Nurney, James.....Au Sable.....1884

O'Brien, J. R.....Detroit, 297 First St.....1885
Orr, J. J.....Tecumseh.....1884
Orr, E. N.....Manistique.....1886
Orth, L. P.....Traverse City.....1886
Osborn, C. A.....Owosso.....1885
*Osborne, G. A.....Luther.....1887
Osborne, W. E.....Grand Rapids.....1885
Owen, W. H.....Maple Rapids.....1886

Padley. W. A.....Benton Harbor.....1885
Paige, L. E.....Sparta.....1886
Parker, A.....Balch, Lenawee Co.....1886
Parker, A. S.....Detroit, 747 Woodward Ave.1883
*Parker, G. J.....Port Huron.....1883
Parker, O. J.....Howell.....1886
Parkill, C. P.....Owosso.....1883
*Parkill, S. E.....Owosso.....1883
Parkhurst, C. G.....Mason.....1885
Parkinson, E. A.....Traverse City.....1885
Paquette, F. D.....Ludington.....1883
Passage, J. H.....Greenville.....1886
Patenaude, A.....Norway.....1887
Patterson, B. M.....Detroit, 182 Gratiot St.....1885
Pauly, L.....St. Ignace.....1887
Peacock, C. M.....Corunna.....1884
Pease, J. F.....Detroit.....1885
Peck, A. W.....Walton.....1883

*Peck, J. E.	Grand Rapids	1885
*Peckham, H. C.	Freeport	1885
*Pegg, H. D.	Morenci	1884
Pemberthy, Edward	Iron River	1887
Perrigo, L.	Burnipps Corners	1886
Perry, D. B.	West Bay City	1883
Perry, F. W. R.	Detroit, 709 Woodward Ave.	1883
Petrie, J. D.	Kalamazoo	1884
Phelps, L. E.	Flint	1884
Phillips, E. F.	Armada	1883
Phillips, F. S.	Ogden	1884
Phillips, W. R.	Battle Creek	1883
Pike, N.	Morley	1886
Pinkerton, R. J.	Bancroft	1884
Pinckney, C. A.	Plymouth	1883
Pitcher, Sheldon	Detroit, 450 Fourth Ave.	1884
Plaat, G. W.	Grand Rapids	1885
Platts, Randolph	Port Sanilac	1884
Porter, W. B	Detroit, Griswold House	1884
*Potter, H. W.	Jenisonville	1887
Power, J. O.	Addison	1884
Prall, D. E.	East Saginaw	1883
Pratt, G. O.	Detroit, 425 Antoine St.	1884
Pratt, Stephen	Howell	1885
*Prescott, A. B.	Ann Arbor	1883
Preston, George	Escanaba	1885
Preston, T. W.	Milbrook	1886
Price, O. J.	Detroit, 485 14th Avenue	1883
Prittie, W. H.	Detroit, 402 Cass Avenue	1885
*Purdy, H. D.	Fennville	1884
Purvis, G. A.	Detroit, 983 Jefferson Ave.	1885
Quick, J. B.	Howard City	1883
Raider, J. F. A.	Newaygo	1883
Randolph, A. M.	Northville	1883
Ray, G. C.	West Bay City (Banks)	1885

Reasner, F. M.	Jackson	1884
Reck, J. A.	North Lansing	1884
Reed, H. T.	White Cloud	1885
Reed, S. M.	White Cloud	1885
*Reidy, Mike	Corunna	1884
Reynolds, W. B.	Eaton Rapids	1883
Rich, J. W.	Manistee	1885
Richards, F. P.	Detroit, 204 Jos. Campau Av.	1885
Richards, T. H.	Detroit, 780 Jefferson Ave.	1884
Richardson, George	Ithaca	1885
Ringler, Eugene	Saginaw	1884
Ripley, L. G.	Montague	1884
Robbins, J. J.	Hubbardston	1883
Roberts, D. O.	Kalamazoo	1887
Robertson, B. J.	Breedsville	1884
Robson, W. L.	Williamston	1883
Roche, W. J	Lake City	1884
Rodenbaugh, H. W.	Paw Paw	1887
*Rodenbaugh, I. N.	Mancelona	1886
Rodenbaugh, O. L.	Mancelona	1885
Rodgers, E. J.	Port Huron	1884
*Rogers, LeRoy	Eastport, Antrim Co	1886
Rogers, T. F.	Lakeview	1887
Ronnefeld, Theo.	Detroit, 193 Gratiot Ave	1883
Ross, E. W.	Detroit, 418 Cass Av.	1883
Ross, W. H.	Grand Rapids, Mt. Vernon Av.	1885
Roussin, V	Ludington	1884
Row, Frank	Lansing	1884
Rowe, Wm.	Scottville	1884
Royer, Jr. Theo.	Ann Arbor	1884
Roys, H. M.	Farwell	1885
Ruchty, Louis	Detroit, 410 Gr'd River Ave.	1884
Rudolphi, A. E.	Dowagiac	1886
Rudolphi, Louis	Dowagiac	1884
Rudolphi, T.	Dowagiac	1883
Rumer, J. F.	Richfield	1885
Rundel, J.	Holton	1886
Runner, J. W.	Shelby	1886
Rushmore, W.	Elk Rapids	1883

Sabin, C. E.	Centerville	1883
Sackett, S. M	Monroe	1883
Safford, O. P.	Flint	1883
Saltzer, A. B.	Detroit, 249 14th Ave	1884
Sawyer, R. J.	Menominee	1883
Sayers, J. A.	Seney.	1885
Schaefer, Wm	Carleton	1885
Schaller, Joseph	Clark, Dakota	1883
Schanher, Joseph	Negaunee.	1884
Schenck, C. E.	———	1885
Schimmell, G. R.	Detroit, 112 Mullett St.	1885
*Schlieper, F. A	Bay City	1884
Schulz, L. S.	St. Joseph	1885
Schumacher, A. B.	Grand Ledge	1884
*Schumacher, A. C.	Ann Arbor.	1887
Schumacher, D. A.	Saugatuck	1884
Scoville, G. R.	Manistee.	1884
Seed, A. W.	Cass City	1885
Seibert, G. F.	Iron Mountain	1883
Seibert, M. L	Marlette	1885
Severson, W. A.	Buchanan.	1883
Share, A. L.	Evart	1885
Shaw, B. C.	Chatham, Ont	1884
Shaw, S. B.	Marlette.	1884
Sheffield, W. E.	Vestaburg	1884
Sherling, F. W.	Grand Rapids	1885
Sherlock, T. J.	———	1885
Sherman, H. B.	Marshall.	1885
Sherwood, C. L.	Dowagiac.	1884
Shook, D. L.	Coral	1884
Short, W. E	Manistee.	1884
Shotwell, R. H.	Leslie.	1885
Sigler, F. A.	Pinckney	1885
Slawson, W. W.	Greenville	1886
Sloan, E. E.	Bancroft.	1885
Smith, A. B.	Trenton	1884
Smith, A. L.	Crystal	1886
Smith, C. M.	Clarkston	1883

Smith, Fletcher	Saginaw	1883
Smith, F. D	Detroit, 919 Gr'd River Ave	1884
Smith, H. W	Farmers	1884
Smith, John F	Ypsilanti	1885
*Snow, H. W	Detroit, (F. Stearns & Co.)	1885
Snow, S. M	Ludington	1883
Snyder, M. H	Grand Marais	1885
Sorg, H. A	Marine City	1884
Soule, C. A	Eaton Rapids	1884
Spayde, W. H	Bloomingdale	1886
Spencer, J. L	Linden	1883
Spencer, M. Ella	Linden	1884
Sprague, O. L	Owosso	1884
Sprague, W. G	Flushing	1883
Stanton, H. N	Sheridan	1885
Stanton, M. B	Sheridan	1885
Starr, George E	Plainwell	1887
Stearns, Fred	Detroit	1884
Steele, Michael	Ionia	1885
Steketee, A. G	Grand Rapids	1885
*Steketee, G. G	Grand Rapids	1885
*Stevens, A. B	Ann Arbor	1883
Stevens, C. R	Northville	1883
Stevens, F. D	Detroit, 133 Woodward Ave	1883
Stevenson, W. E	Homer	1885
Stevenson, A. W	Muskegon	1886
Stewart, M. W	———	1883
Stiles, T. P	Chester	1886
*Stone, C. G	Detroit, 580 Lafayette Ave	1884
*Stover, H. E	Kalkaska	1886
Stringer, G. W	Detroit, 898 Michigan Ave	1884
Strong, J. L	Bessemer	1886
Suffield, B	Bautoul, Ill	1886
Sullivan, J. H	Whitehall	1885
Swaby, G. A	West Bay City	1885
Sweet, B. F	Carson City	1885
Swift, George	Detroit, 7 Lafayette Ave	1883

Taylor C. W.	Loomis	1885
Taylor, E. J.	Vassar	1884
Taylor, J. A.	Detroit, 148 Third St.	1884
Teetzell, W. H.	Detroit, 805 Fort St., E.	1884
Terrill, B. E.	Muir	1886
Thompson, A. L.	Harbor Springs	1887
Thompson, H. G.	Menominee	1886
Thumb, Hugo	Grand Rapids	1884
Tibbits, A. H.	Port Huron	1885
Tibbs, W. H.	Grand Rapids	1886
Tickner, George	Wyandotte	1885
Tillitson, W. J.	Laingsburg	1886
Tillson, Fred P.	Ishpeming	1887
Tilton, B. E.	Bay City	1885
Tobey, N. I.	Sturgis	1884
Todd, A. M.	Nottawa	1887
*Todd, F. J.	Detroit, (J. E. D. & Co.)	1886
Todd, W. F.	Flint	1883
Tomlinson, W. A.	Au Sable	1884
Torontaly, Paul	East Tawas	1885
Travis, F. A.	St. Johns	1885
Treat, A. B.	Adrian	1884
Tredwell, J. H.	Detroit, 51 Shelby St.	1885
Trempe, Joseph	Sault Ste. Marie	1885
*Trowbridge, Theo	Decatur	1884
Tubbs, C. C.	Chesaning	1883
Tucker, W. S.	Stanwood	1886
Tullgren, A.	Iron Mountain	1886
Tupper, F. L.	Meredith	1885
Turner, D. D.	Whitehall	1884
Turner, R.	Flat Rock	1886
Tuttle, W. A.	Grand Rapids	1883
Tweedale, J. R.	Muskegon	1884
Van Bochove, R.	Grand Rapids	1886
Vandecar, J. H.	North Branch	1883
Vanden Belt, Nicholas	Detroit, 33 Lafayette Ave	1884

Van Der Veen, Jacob	Grand Haven	1885
Van Leeuwen W. H.	Grand Rapids	1885
Van Marter, Ezra	Leslie	1884
Van Vranken, G. D.	Cadillac	1885
*Varnum, E. C	Jonesville	1884
Varnum, G. C	Jonesville	1884
Vaughan, B. D	Bellevue	1884
Vedder, E. H.	West Bay City	1885
Vennema, H. A.	Menominee	1885
*Vernor, James	Detroit, 235 Woodward Ave.	1884
Vincent, J. T	Lapeer	1884
Voller, J. H	Evart	1886
Vyne, N. A.	Fremont	1886
Wagar, F. G	Edmore	1885
*Wagener, C. H.	Big Rapids	1883
Wagner, A	Eastmanville	1886
Waite, C. M	Homer	1886
Waite, G. W	Coldwater	1884
Wait, S. E	Traverse City	1884
Wales, T. P	West Bay City	1885
*Walker, W. K	Lansing	1883
Wallace, G. E	Hopkins	1885
Wallace, A. S.	St. Johns	1883
Walsh, Heber	Holland	1885
Walthausen, G. L. F. von	Bay City	1885
Walthausen, Werner von	Bay City	1884
Waples, Grafton	Detroit, 371 Woodward Ave.	1884
Ward, G. J.	St. Clair	1884
Ward, W. A	Eau Claire	1886
*Warne, F. C	East Jordan	1886
Warner, S. H.	Marlette	1886
Warner, W. A	Detroit (T. H. H. & Sons)	1884
Wasson, J. H.	Hoytville	1883
Watson, J. B.	Coopersville	1884
*Watson, W. A.	Breckenridge	1887
Watts, Isaac	Grand Rapids	1883

Watz, H. G.	Saginaw	1884
Weaver, Ezra	Reading	1886
Webb, B. S.	Alma	1886
*Webb, E. T.	Jackson	1885
*Webber, A. H.	Big Rapids	1884
*Weeks, A. A.	Grattan	1887
Weise, H. L.	Detroit, 192 Hastings St.	1884
Weller, Martin	Fowler	1885
Wells, C. A.	Brockway Centre	1886
*Wells, Frank	Lansing	1883
Wells, L. B.	Pontiac	1884
Weston, Daniel	Buchanan	1884
Wheat, J. H	St. Johns	1885
Wheeler, C. F.	Hubbardston	1884
Wheeler, Obed	Berrien Springs	1885
Wheelock, N. L.	Dowagiac	1884
Whelpley, B. I	Hoytville	1884
Whipple, G. N	Detroit, 222 Orleans St.	1885
White, A. F.	Port Huron	1885
White, L. T.	Eaton Rapids	1883
White, W. E	Grand Rapids	1886
White, W. L.	Grand Rapids	1884
Whitfield, G. F.	Grand Rapids	1886
Whitton, R. L.	Clifford	1884
Wicker, C. D.	Coldwater	1883
Wiede, Henry	Reese	1885
Wiesinger, J. G	East Saginaw	1884
Wiggins, A. H.	Lawrence	1884
*Wilbur, C. H	St. Ignace	1887
Wilders, A. J.	Ortonville	1885
Wilkins, F. C.	Union City	1885
Wilkinson, J. L.	———	1884
Willard, H. W	Manistee	1885
Willard, Thomas	Bear Lake	1885
Williams, H. M.	Mason	1885
Williams, W. C	Detroit, (F., W. & Co.)	1884
Williamson, G. E.	Vassar	1885
*Williamson, John	Detroit, 81 Woodward Ave.	1884

Wilson, A. H.	Grand Rapids	1884
*Wilson, E.	Stanwood	1887
Wilson, E. R.	Grand Rapids	1887
Wilson, G. A.	Charlevoix	1884
Wilson, L. S.	St. Joseph	1883
Wilson, M. V.	Sand Lake	1886
Wilson, W. A.	St. Johns	1884
Wilson, W. B.	Muskegon	1883
Wilson, W. E.	Grand Ledge	1884
Withe, A. F.	———	1884
Witherspoon, G. A.	Chatham, Ontario	1885
Witherspoon, P. E.	Harrison	1885
Wolf, J. G.	Hillsdale	1883
Wolfinger, C. E.	Hopkins Station	1884
Wood, J. E.	Charlevoix	1884
Wood, Will H.	Sheridan	1887
Woods, T. T.	Belleville	1885
Woodward, M. G.	Lake City	1884
Woolford, R. S.	Mecosta	1886
Woolsey, F. F.	Hartford	1884
Wright, Charles.	Detroit, 15 Jefferson Ave.	1883
Wright, C. A.	Tecumseh	1884
Wright, E. A.	Pentwater	1885
*Wurzburg, F. J.	Grand Rapids	1884
Yeomans, E. T.	Ionia	1883
Young, C. A.	Battle Creek	1884
Young, E. A.	Clio	1886

DROPPED FOR NON-PAYMENT OF DUES.

	Elected.	Dropped.
Calkins, H. W.	1883	1887
Carman, N. F.	1883	1887
Douglass, F. M.	1883	1887
Forest, G. W	1883	1887
Francis, J. L.	1883	1887
Hamilton, C. W.	1883	1887
Look, J. Q.	1883	1887
Lumbard, W. D.	1883	1887

HONORARY MEMBERS.

Douglas, S. H.	Ann Arbor.	1886
Duffield, S. P.	Detroit	1887
Englehard, G. P.	Chicago, Ill.	1883
Garrigues, S. S.	Ann Arbor.	1884
Le Caron, H.	Braidwood, Ill.	1883
Stowell, Mrs. L. R.	Ann Arbor.	1887
Vaughan, V. C.	Ann Arbor.	1887
Wrampelmeier, T. J.	San Diego, Cal	1887

DECEASED MEMBERS.

		Elected.	Died.
Andrus, W. S.	Utica	1883	1886
Cole, L. W.	Petoskey	1885	1887
Coman, L. S.	Bay City	1884	1887
Escott, E. B.	Grand Rapids	1884	1885
Escott, L. W	Grand Rapids	1885	1886
Hipkins, E. S.	Blanchard	1883	1887
Hyde, W. L.	Marshall	1884	1886
Jones, E. L.	Battle Creek	1883	1886
Laubengayer, J. F.	Owosso	1884	1887
Parsons, H. B.	New York	1884	1885
Riebe, Carl.	Ann Arbor	1883	1885
Shepherd, H. T.	Detroit	1885	1885

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ERRATA.

Page 38, l. 15 from top, for "and keep" read "a copy of."

Page 72, l. 4 and 5, the paper in response to Query 5 was not presented, as stated; l. 16, after "No.," insert "27;" l. 21, for "Swaluwenburg" read "Zwaluwenberg;" l. 23, for "Slotterbeck" read "Schlotterbeck."

Page 106, l. 4 from top, for "and," after "U. S. P.," read "or."

Page 107, l. 7 from bottom, for "9.60" read ".960."

The date of the next meeting, given on p. 2 as Oct. 9, 10 and 11, will doubtless be changed to the first week in September.

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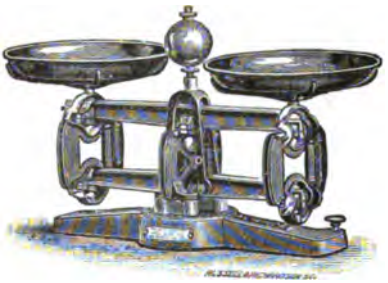
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FIRST, STRENGTH.—In commerce the value of every commodity is based upon its strength, alcohol being priced according to the amount of proof spirit which it contains; cinchona barks by the amount of alkaloid present, and so with almost all crude materials. Conceding the fact, as all must, that it is a matter of comparative ease to determine the digestive strength of pepsin, should not the same methods be observed in its purchase? If then, our claims for pepsinum purum in lamellis are justified by fact, obviously it is worth just twice as much as any other product, although now offered at about the figure asked for standard brands.

If dilutions of definite strength are to be manufactured, then one part of this pepsin will go just twice as far as one part of the next best, for as is well known, it is capable of dissolving 2000 times its weight of coagulated egg albumen, under the conditions of our published test.

Pharmacists may contend that notwithstanding these facts, physicians will prescribe this pepsin in exactly the same doses as they have heretofore prescribed inferior and cheaper brands, and that therefore the prescription will cost them, and consequently the customer, more. If this argument is well founded, then the physician's act must be ascribed to ignorance of the fact that the therapeutic value of pepsin is entirely dependent upon its ability to dissolve proteids, and it should be a matter of ease for any pharmacist to convince him that one half the quantity of our product would accomplish the effect which he had been deriving from a given quantity of other brands.

SECOND, QUALITY.—Being satisfied that this pepsin possesses a higher digestive power than other products, the fact should not be lost sight of, that in medicine, the best is invariably the cheapest, and that when the physician feels that his patient will be provided with the best material obtainable, when patronizing a certain drug store, his confidence in the pharmacist will be such as to induce him to influence considerable trade.

THIRD, STABILITY.—As is well known, preparations of the digestive ferments are prone to deterioration, and although the pharmacist may not be conscious of the fact that certain products upon his shelves are gradually losing their value, it is nevertheless suicidal for him to dispense anything but an active medicament, and in the purchase of pepsin he should feel that he is obtaining a product which will retain its medicinal properties. Our pepsin has been found to be absolutely permanent after long continued exposure to deteriorating influences. We ask pharmacists to subject it to the utmost rigid test, and when convinced of its relative superiority and cheapness, to specify it in ordering.

Very respectfully yours, **PARKE, DAVIS & CO.,**

Manufacturing Chemists, DETROIT, MICH.

NEW YORK: Office, 49 Maiden Lane. Warehouse and Shipping Depot, 2 Liberty St. Crude Drug Warehouse, 218 Pearl St.

PROCEEDINGS

OF THE

MICHIGAN STATE

PHARMACEUTICAL ASSOCIATION

AT ITS

SIXTH ANNUAL MEETING,

HELD AT

DETROIT,

SEPTEMBER 4, 5, 6 AND 7, 1888.

ALSO, THE

Constitution and By-Laws, Roll of Members, Etc.

ANN ARBOR, MICH.:
THE COURIER PRINTING ESTABLISHMENT,
1889.

NOTICE.

MEMBERSHIP.

Blank applications for membership will be furnished by the Secretary upon request.

PROCEEDINGS.

Extra copies of the Proceedings can be obtained of the Secretary at the following prices:

Proceedings of 1883	25 cents.
Proceedings of 1884	50 cents.
Proceedings of 1885	50 cents.
Proceedings of 1886	50 cents.
Proceedings of 1887	50 cents.
Proceedings of 1888	50 cents.

All the above together $2.00.

N. B.—If you change your residenee, if your name or address is incorrectly given in the Membership Roll, or if you learn of the death of a fellow member, please notify the Secretary at once.

The next annual meeting of the Association will be held in Detroit, Sept. 10, 11 and 12, 1889.

H. J. BROWN, Secretary,
Ann Arbor, Michigan.

Past Officers of the Association.

PRESIDENTS.

FRANK WELLS ---------- LANSING, 1883–84
G. W. CROUTER ---------- CHARLEVOIX, 1884–85
H. J. BROWN ---------- ANN ARBOR, 1885–86
F. J. WURZBURG ---------- GRAND RAPIDS, 1886–87
A. BASSETT ---------- DETROIT, 1887–88

VICE-PRESIDENTS.

ISAAC WATTS ---------- GRAND RAPIDS, 1883–84
I. LEROY H. DODD ---------- BUCHANAN, 1883–84
WILLIAM B. WILSON ---------- MUSKEGON, 1883–84
GEORGE McDONALD ---------- KALAMAZOO, 1884–85
BURR D. NORTHRUP ---------- LANSING, 1884–85
FRANK J. WURZBURG ---------- GRAND RAPIDS, 1884–86
A. B. STEVENS ---------- DETROIT, 1885–86
FRANK INGLIS ---------- DETROIT, 1885–87
MRS. C. H. TAYLOR, M. D. ---------- LOOMIS, 1886–87
HENRY HARWOOD ---------- ISHPEMING, 1886–87
GUY M. HARWOOD ---------- PETOSKEY, 1887–88
H. B. FAIRCHILD ---------- GRAND RAPIDS, 1887–88
H. KEPHART ---------- BERRIEN SPRINGS, 1887–88

SECRETARIES.

JACOB JESSON ---------- MUSKEGON, 1883–85
STANLEY E. PARKILL ---------- OWOSSO, 1885–88

LOCAL SECRETARIES.

A. W. ALLEN ---------- DETROIT, 1883–85
WM. L. WHITE ---------- GRAND RAPIDS, 1885–86
GUY M. HARWOOD ---------- POTOSKEY, 1886–87
JAS. VERNOR ---------- DETROIT, 1887–88

TREASURER.

WM. DUPONT ---------- DETROIT, 1883–88

Officers of the Association.

1888-89.

PRESIDENT.

GEORGE GUNDRUM.....IONIA.

VICE-PRESIDENTS.

F. M. ALLSDORF.....LANSING.
H. M. DEAN.....NILES.
O. EBERBACH.....ANN ARBOR.

SECRETARY.

HENRY J. BROWN.....ANN ARBOR.

LOCAL SECRETARY.

ARTHUR BASSETT.....DETROIT.

TREASURER.

WM. DUPONT.....DETROIT.

EXECUTIVE COMMITTEE.

A. H. LYMAN.....MANISTEE.
F. J. WURZBURG.....GRAND RAPIDS.
E. T. WEBB.....JACKSON.
A. BASSETT.....DETROIT.
W. A. HALL.....GREENVILLE.

Committees, 1888-89.

TRADE INTERESTS.

A. BASSETT.....Detroit.
F. W. FINCHER.....Pentwater.
L. T. BEACH.....Bay City.

PHARMACY AND QUERIES.

A. B. PRESCOTT.....Ann Arbor.
O. EBERBACH.....Ann Arbor.
S. E. PARKILL.....Owosso.

LEGISLATION.

J. E. PECK.....Grand Rapids.
JACOB JESSON.....Muskegon.
JAMES VERNOR.....Detroit.

ADULTERATIONS.

PROF. O. C. JOHNSON.....Ann Arbor.
A. S. PARKER.....Detroit.
H. W. SNOW.....Detroit.

MEMBER OF COMMITTEE ON UNOFFICIAL FORMULARY.

A. B. STEVENS.....Ann Arbor.

EDITOR OF PROCEEDINGS.

H. J. BROWN.....Ann Arbor.

Delegates.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Meeting at San Francisco, Cal., June 24th, 1889.

DELEGATES.	*ALTERNATES.*
F. M. ALLSDORF, Lansing.	FRANK WELLS, Lansing.
JACOB JESSON, Muskegon.	WM. DUPONT, Detroit.
GEO. MCDONALD, Kalamazoo.	A. H. WEBBER, Big Rapids.
S. E. PARKILL, Owosso.	G. W. STRINGER, Detroit.
F. J. WURZBURG, Grand Rapids.	C. E. KELLOGG, Grand Rapids.

ILLINOIS PHARMACEUTICAL ASSOCIATION.

Meeting at Quincy, Aug. 16, 1889.

B. D. NORTHRUP, North Lansing. | O. P. SAFFORD, Flint.
H. KEPHART, Berrien Springs.

INDIANA PHARMACEUTICAL ASSOCIATION.

Meeting, 1889.

J. W. CALDWELL, Detroit. | C. E. FOOTE, Jackson.
C. H. WAGENER, Big Rapids.

OHIO PHARMACEUTICAL ASSOCIATION.

Meeting at Mansfield, June 4th, 1889.

A. W. ALLEN, Detroit. | C. W. HULL, Bay City.
S. M. SACKETT, Monroe.

WISCONSIN PHARMACEUTICAL ASSOCIATION.

Meeting at Portage, Aug. 13th, 1889.

V. H. MIDDLETON, Grand Rapids. | J. G. JOHNSON, Traverse City.
J. H. PASSAGE, Greenville.

COMMITTEE

—ON—

Local Organization and Membership.

GEO. GUNDRUM, CHAIRMAN, Ionia.

County.	Name.	Residence.
Alcona	B. F. BUCHANAN	Harrisville.
Allegan	C. H. ADAMS	Otsego.
Alpena	CHARLES HOWARD	Alpena.
Antrim	O. L. RODENBAUGH	Mancelona.
Barry	F. HOTCHKISS	Hastings.
Bay	F. H. J. VAN EMSTER	Bay City.
*Berrien	H. KEPHART	Berrien Springs.
Branch	C. D. WICKER	Coldwater.
Calhoun	F. S. PARKER	Battle Creek.
Cass	C. L. SHERWOOD	Dowagiac.
*Charlevoix	LOUIS J. FASQUELLE	Charlevoix.
Cheboygan	C. A. BIGBEE	Cheboygan.
*Clare	J. W. DUNLOP	Clare.
Clinton	A. O. HUNT	St. Johns.
Delta	J. N. MEAD	Escanaba.
Emmett	A. L. THOMPSON	Harbor Springs.
Eaton	H. A. BLACKMAR	Charlotte.
Hillsdale	E. C. VARNUM	Jonesville.
Huron	I. D. LANE	Sand Beach.
Ingham	F. M. ALSDORF	Lansing.
*Ionia	W. R. CUTLER	Ionia.
*Isabella	C. W. TAYLOR	Loomis.
*Jackson	E. T. WEBB	Jackson.
*Kalamazoo	GEORGE MCDONALD	Kalamazoo.
Kalkaska	H. E. STOVER	Kalkaska.
*Kent	F. J. WURZBURG	Grand Rapids.
Lapeer	F. E. BRISTOL	Lapeer.
Lenawee	H. D. PEGG	Morenci.

* Has a County Association.

County.	Name.	Residence.
Livingston	F. E. JUDSON	Brighton.
Manistee	A. H. LYMAN	Manistee.
Marquette	HENRY HARWOOD	Ishpeming.
*Mason	F. N. LATIMER	Ludington.
*Mecosta	C. H. WAGENER	Big Rapids.
Menominee	R. J. SAWYER	Menominee.
Midland	M. ANDERSON	Midland.
Missaukee	M. J. ROACH	Lake City.
*Monroe	S. M. SACKETT	Monroe.
Montcalm	J. H. PASSAGE	Greenville.
Muskegon	J. R. TWEEDALE	Muskegon.
Newaygo	J. F. A. RAIDER	Newaygo.
Oakland	J. S. HEWELL	Milford.
*Oceana	F. W. FINCHER	Pentwater.
Ontonagon	J. L. STRONG	Bessemer.
*Otsego	N. P. BLAKESLEE	Elmira.
Ottawa	HENRY BAAR	Grand Haven.
*Saginaw	D. E. PRALL	East Saginaw.
St. Joseph	J. V. OKEY	Colon.
Sauilac	JAMES FISHER	Marlette.
Schoolcraft	E. W. ORR	Manistique.
Shiawassee	W. H. BIGELOW	Owosso.
Traverse	JAMES G. JOHNSON	Traverse City.
Tuscola	E. A. BULLARD	Vassar.
Van Buren	T. TROWBRIDGE	Decatur.
Washtenaw	ALBERT MANN	Ann Arbor.
*Wayne	A. W. ALLEN	Detroit.
Wexford	R. J. CUMMER	Cadillac.

* Has a County Association.

MEMBERS

OF THE

Michigan State Board of Pharmacy.

FOR 1888-89.

OTTMAR EBERBACH, ANN ARBOR,	Term Expires Dec. 31, 1889.
GEORGE McDONALD, KALAMAZOO,	Term expires Dec. 31, 1890.
STANLEY E. PARKILL, OWOSSO,	Term expires Dec. 31, 1891.
JACOB JESSON, MUSKEGON,	Term expires Dec. 31, 1892.
JAMES VERNOR, DETROIT,	Term expires Dec. 31, 1893.

OFFICERS OF THE BOARD.

PRESIDENT.

GEORGE McDONALD.....KALAMAZOO.

SECRETARY.

JACOB JESSON.....MUSKEGON.

TREASURER.

JAMES VERNOR.....DETROIT.

MEETINGS.

The regular meetings of the Board are held on the first Tuesday of March, July and November. Special meetings at the call of the Board.

The Seventh Annual Meeting will be held at Detroit, Sept. 10, 11 and 12, 1889.

MINUTES

OF THE

SIXTH ANNUAL MEETING

OF THE

Michigan State Pharmaceutical Association.

FIRST SESSION.

TUESDAY FORENOON, SEPT. 4TH, 1888.

The Association was called to order by the President, Mr. Arthur Bassett, who said:

Ladies and Gentlemen.—The time has again arrived when we open our State Association. We had hoped, of course, to have a larger number present, but we are glad to see some familiar faces, and we hope as our meeting progresses that the number will be greater. We will open our proceedings by joining in prayer with the Rev. Dr. Barclay.

Prayer by Rev. Dr. Barclay.

PRESIDENT: We had the pleasure yesterday, at the meeting of the American Association, of listening to a very cordial address of welcome from one of our honored citizens. This same gentleman we will have the pleasure of listening to to-day, and as he has had time since that address to go over it and retouch it, and polish it up, we expect he will welcome us with greater eloquence than he did yesterday. I have the pleasure of introducing the Hon. William C. Maybury.

MR. MAYBURY: *Ladies and Gentlemen,*—If I did not know to the contrary, I should assume that my good friend here was like

myself, an Irishman, and that he had paid very close attention to that distinguished stone in the old country they call the blarney stone, and while I appreciate the courtesy and the kindness of my friend's introduction, it is like introducing a man to an audience and throwing a blanket right over him; but I am glad to say that in all the sobriety of the business in which he is engaged there is an undertone of quiet, pleasant humor and wit, and I hope he will live many years to enjoy that pleasing manner which characterized him this morning.

I am here representing the chief executive of the city to bid you welcome to the city of Detroit. I had occasion yesterday to say a few words to strangers who came amongst us, and I tried to say them with a heartiness which the occasion demanded, but this morning it seems rather a work of supererogation to welcome the people of Michigan to the city of Detroit. Why, we are one, identical. Your welcome in Detroit is not only on this occasion, but on all occasions. Your commercial and social interests are so closely identified that we may well say we have no pride in the city but you are common sharers, and I should not welcome you to Detroit but as friend meets friend on a beautiful morning like this, meets and greets you and says "good morning." It is not my province this morning to speak of the very many things that might be said concerning your meeting, the purposes and objects of the great business in which you are engaged. I am here simply to extend this fraternal greeting, but I cannot refrain from saying that which I know will not offend the modesty of anyone, that the people of Detroit are very proud indeed of the business in which you are engaged, and that the men who are engaged in this business are men whom we highly honor. I need not call attention to the researches that are being made in pharmaceutical science; how every secret of nature seems to have been drawn forth to the light. But there is one single thought that you will permit me to utter, because it lies very close to my heart, and that is this: I believe that in the world to-day there is not an evil that is so fraught with ill to humanity as the adulteration of the people's food and the people's medicine. I believe that the great question of temperance which is agitating the public mind, and engaging the attention of every thoughtful person throughout the land, will find a larger measure of its solution in the enforcement of rigid laws against the adulteration of liquor than in any other course that I can see open to the people. I believe that it often happens, gentlemen, whether accidentally or not I do not know, that the arresting of disease is as

much prevented by the adulteration of the drug as it is by the incompetency of the practitioner. I believe that those peculiar cases that we find in every community, a disease which seems to be tractable to certain modes of procedure gets entirely beyond the range of control in some unaccountable manner, the cause can be traced to impure drugs more often than through the incompetency of the physician. Now, my friends, I believe that there never was a field open for human endeavor that promised so much of good to humanity, and that should receive so much of the gratitude of mankind as that field in which men dare to enter and speak plainly upon this subject of adulteration of human food, and I confess to-day that, among the regrets which I have in connection with my own short public life is the fact that, conscious as I am from investigation and from experience of the wide-reaching evil of this matter of adulteration, I did not make that the one theme of my public career.

You are assembled my friends as persons engaged in a not entirely selfish business. You know it sometimes happens that the world cares little for what people do, that is the nature of the business is so confined to themselves that there is no result, either good or evil, to anybody. But the business in which you are engaged is a business that lies close to the heart of everybody. The progresses you make, whatever selfish advantages they bring to you brings also some advantage to me. The evils which exist and the injury they may be to you brings also an injury to me, therefore, there is a peculiar reason why every community should take a special interest in welcoming you, for I assume you are here to counsel together, not only for honorable dealing with yourselves, but to insure fair and honorable dealings with humanity, so closely identified with your business. That being your object, I welcome you to the city of Detroit as you would be welcomed to civilized communities everywhere.

PRESIDENT: I am sure you will appreciate this hearty welcome to this city, and in order to express your appreciation we have selected to answer this eloquent gentleman one of our number, who when he has his "cue," is always able to make a good speech. I therefore call upon Mr. H. J. BROWN, of Ann Arbor, to respond to this welcoming address.

MR. BROWN: I hardly think it was a matter of necessity that

any words of welcome should have been spoken to this Association, so many times have we met here, and always have we received such a cordial welcome, and yet we are grateful for having such pleasant words spoken to us as we have listened to this morning. Words of welcome always fall with a pleasant sound. It matters not by whom they are spoken. I am sure if it were not necessary that any formal address of welcome should be made it is certainly unnecessary that any formal response to that address should be made, especially by anyone other than the intelligent chairman of our Association. He it is, in my judgment, who should have been asked to respond to the words of welcome. And now, what can I say? Is it necessary that I should say anything, but that we thank you most heartily for these words? To be sure, if I were an orator, I might dwell upon the beauties of your city. I might talk about your wonderful manufacturing industries, your great laboratories, and enterprising business houses. I might even rise to such sublime heights of oratory as to pay a compliment to your wonderful base ball club. But all these things are unnecessary. These formal responses generally go over all that ground. I think it has been gone over in this city on several occasions and in the usual form ends up with a tribute to your "mighty river, upon whose bosom floats the commerce of the Great Lakes of the North," and all that sort of thing. But I think we have other business in hand this morning, and it would be wasting the time of this association for me to make an attempt at anything of the kind. Therefore, I shall not occupy a moment of your time.

Mr. WELLS: There being such a limited number of the members of the State Association in attendance, it has occurred to me that it would be well to postpone the reading of the President's address until our meeting this afternoon. I know from some experience I have had myself how disagreeable it is for a person to spend a long time in preparing a paper and then be obliged to read it to a small audience. Therefore I move that the reading of the President's address be postponed until our meeting at 2 o'clock this afternoon. I believe at that time a great many who are now en route will be here and perhaps some members of the American Association will be glad to attend.

The motion was seconded and carried.

The Secretary then read the following list of names as applicants for membership in the Association, the same having been approved by the Executive Committee:

Henry M. Adams, Port Huron.
Carl N. Anderson, Detroit.
Frank E. Atchinson, Gladwin.
Rolla S. Armstrong, Chelsea.
C. H. Blatchley, Manistee.
M. G. Bailey, Mackinac Island.
Frank Barry, Rodney.
Renssellaer G. Beckwith, Bradley.
John Bell, Lexington.
Chas W. Bennett, Quincy.
Chas. A. Bird, Detroit.
John R. Black, Detroit.
Chester E. Bricker, Port Huron.
Wm. J. Brown, Marquette.
E. E. Calkins, Ann Arbor.
Geo. Campbell, Grand Ledge.
Robt. A. Campbell, Port Huron.
F. D. Caulkins, Clarketon.
John B. Collins, Frankfort.
E. F. Chester, Cedar Springs.
Cornelius Crawford, Gd. Rapids.
Walter Crawford, Milford.
J. B. F. Curtis, M. D., New Lothrop.
Geo. S. Darling, Tawas City.
Caspar E. DePuy, Stockbridge.
Peter A. DeWit, Spring Lake,
Frank W. Dorr, Manchester.
F. C. Davis, Vassar.
Chas. K. Esler, Grand Haven.
O. J. Fay, Carleton.
Chas. S. French, Hillsdale.
Hubert L. Gladwin, Merrill.
Otis Gould, Henderson.
Stephen A. Griggs, Detroit.
S. H. Goodwin, Detroit.
H. E. Grand-Girard, Big Rapids.
Frank A. Hodges, Parma.
Fred S. Hopkins, Benton Harbor.
Chas. F. Hueber, Port Huron.
F. O. Hudnutt, Hanover.
Geo. P. Harmon, Mackinaw City.
Geo. C. Hall, Detroit.
E. E. Huyck, Clio.
A. H. Hairkins, Clayton.
Florence Hendershott, Manistee.
M. A. Jones, Big Rapids.
Henry Junker, Colon.
H. C. Knill, Jr., Port Huron.
F. C. L'Hommedieu, Detroit.
Jesse F. Mason, Warren.
Jas. J. Matthews, East Tawas.
Robt. S. McKibben, Detroit.
Thos. H. Mills, Port Huron.
Samuel S. Morris, Pincomning.
Percy F. Nasmyth, Detroit.
Mrs. W. H. Niver, Chesaning.
Jason T. Perham, Kent City.
Thos. W. Perkins, Detroit.
L. A. Phelps, Saugatuck.
H. S. Phillips, Middleton.
Leon R. Pierson, Kalamazoo.
Fred Plesner, West Bay City.
A. S. Putnam, Manistique.
G. J. O. Pfeiffer, Detroit.
James Raizon, Wakefield.
Owen Raymo, Wayne.
Jas. A. Redmond, Sandusky.
O. H. Robinson, Grand Rapids.
Samuel Revell. Roscommon.
Aaron Rogers, Ravenna.
T. W. Richmond, Bear Lake.
Chas. A. Seely, Lansing.
Chas. D. Stanley, Onekama.
Wm. T. Stringham, Shelby.
Frank E. Sweetser, Port Huron.

W. W. Swinnerton, Niles.
John D. Strachan, Muir.
A. A. Schott, East Saginaw.
E. S. Swayze, Otisville.
S. K. Snodgrass, Grand Rapids.
M. L. Thompson, Greenville.
F. W. Van Wickle, Shelby.
Wm. Wastall, Port Huron.
Julius Weiss, Monroe.
Clark F. Williams, Caledonia.
W. N. Worcester, Coldwater.
Frank Willett, M. D., Monroe.
Wm. A. Wood, Six Lakes,
E. B. P. Wilders, Oxford.
Jean P. Williams, Climax.
S. E. Young, Lakeview.
H. W. Yates, Big Rapids.
W. A. Zimmer, Manistee.

A motion was carried that the Secretary cast the ballot of the Association for their election, which being done they were declared duly elected.

Mr. J. W. Caldwell then read a paper on "Adulteration of Powdered and Ground Slippery Elm." (For paper see "Answers to Queries.")

AFTERNOON SESSION.

The Association was called to order by the President.

PRESIDENT: The first thing in order this afternoon will be the presentation of applications for membership by the secretary.

SECRETARY: The following names have been approved by the Executive Committee:

E. S. Anderson, Detroit.
Harry G. Baker, Detroit.
Josiah Black, Detroit.
E. Wm. Bolio, Detroit.
James B. Booth, Detroit.
B. S. Buchanan, Detroit.
John E. Campbell, Detroit.
Harvey C. Clark, Detroit.
George S. Davis, Detroit.
Thomas W. Davis, Detroit.
Clyde S. Demorest, Detroit.
George C. Dennis, Rochester.
Jacob S. Farrand, Jr., Detroit.
P. D. Gibson, Detroit.
James H. Glover, Detroit.
Julius Greenthal, Detroit.
Frank P. Hess, Detroit.
John M. Hinchman, Detroit.
Theodore H. Hinchman, Detroit.
Henry C. Hisner, Detroit.
Charles E. Hollister, Detroit.
Frederick Humburg, Detroit.
D. H. Hunt, St. Johns.
W. F. Jackman, Detroit.
William C. Johnson, Detroit.
William Kerr, Detroit.
Chas. A. Lenhard, Detroit.
August Magdalener, Detroit.
Chas. F. Mann, Detroit.
Geo. D. MacKimmie, Detroit.

Henry M. Morris, Detroit.
Chas. P. Nash, Detroit.
John T. Norton, Rochester.
B. Wood Palmer, Detroit.
Geo. S. Perren, Detroit.
Chas. A. Poole, Detroit.
Edward J. Robinson, Detroit.
Wm. H. Robinson, Detroit.
B. Royce Sheldon, Detroit.
Alfred E. Steiger, Detroit.
Chas. K. Trombley, Detroit.
Nicholas F. L. Van Slype, Detroit.
Alfred L. Walker, Detroit.
Adam Walldorf, Detroit.
William M. Warren, Detroit.
R. Alexander Watson, Detroit.
Henry A. Wetzel, Detroit.
Richard P. Williams, Detroit.
W. V. Windover, Detroit.
Chas. H. Woods, Detroit.
Henry J. Webb, Cassopolis.

PRESIDENT: You have heard these names. What is your pleasure in regard to them?

On motion of Mr. Brown, the Secretary was directed to cast the ballot of the Association, and the applicants were duly elected.

PRESIDENT: I will state that this makes 143 new members who have been elected at this meeting, making the total membership of the Association 971. This makes us the largest Association in the United States at the present time.

Vice president Fairchild was then called to the chair.

Mr. FAIRCHILD: The next thing in order will be the reading of the President's address.

The President then read his address, which was as follows:

PRESIDENT'S ADDRESS.

Ladies and Gentlemen of the Michigan Pharmaceutical Association: Again we have assembled in this our sixth annual gathering for the purpose of reviewing what we have done in the past year, and conferring together so that we may plan for more effective work to be carried on by our Association in the year before us.

We have now attained the full vigor of manhood in our growth, let us plan accordingly, and use our strength wisely, to accomplish the worthy objects aimed at.

That ever present and always busy, Angel of Death, has vis-

ited us during the year and claimed eight of our number. We sorrow over their loss, and yet, is not our loss their gain?

In accordance with the recommendation of President Wurzburg, the appointments for the carrying on of local organization were made. The results, while not all that could be desired, have been good in the main. Much good has been accomplished by bringing the Pharmacists of localities together, even where they have not kept up an active organization. One or two social meetings during the year without a society will do much towards bringing Pharmacists into agreeable relations with each other.

The business of the Association during the past year has gone along very smoothly. The results will be laid before you by the Secretary and Chairmen of the various committees.

The most active work done by your President was the securing of the petition asking the A. P. A. to meet here with us, about five hundred names were secured, representing nearly every locality in the State, this was accomplished in five days, and is thought to have had a large influence in bringing the meeting here.

Owing to the death of Mr. R. L. Latimer, of Jackson, a member of the committee on trade interests, Mr. J. E. Peck, of Grand Rapids, was placed on that committee and is entitled to share in the credit given that committee for their labor.

We have met with a serious loss in the scientific part of our work, by the removal of Dr. Lyons to the Sandwich Islands. He was ever ready to help with his pen and voice. We owe much to him and trust he will soon see the error of his ways and return to us.

It is my pleasure to state that every officer of the Association has performed his duties with care and promptness, each one has been fully alive to the welfare of the Association, and it is largely owing to their efforts that we are the largest State Pharmaceutical Association in the U. S.

Our local Secretary, Mr. James Vernor, is particularly entitled to credit for his work, for it is largely owing to his untiring zeal and labor that everything is in such admirable shape for these meetings.

I desire to thank the officers and members of the Association for the kindly feeling shown me during the year. Not one unpleasant thing has occurred in my official capacity during the year.

Fortunately for us, in common with the rest of the people of the State, the State Legislature meets but once in two years. The past year was not their year for meeting. Therefore we have not been

annoyed by any new and unjust laws; that we shall escape in the future is more than we can hope for.

That we have been unjustly accused, as a whole, of selling liquors unlawfully, and that legislation unjust to us has been attempted, I think you will all agree. How shall we guard against future attempts of the same nature?

Allow me to suggest that we use our influence to secure the sending to the Legislature of men who understand the needs and requirements of our business, and who are able and willing to advocate our claims to have justice done us in framing the laws.

We have a State University which is justly the pride of the State, there is a thoroughly equipped Laboratory and the best of teachers in Chemistry and Pharmacy connected with it. Young men and women, too, are graduated from this best of schools, fitted to go out and do their part in preparing medicines according to the recognized standard of the United States Pharmacopea for the relief and cure of pain and sickness.

There are others who though they have not enjoyed the advantages of a training like the above, have through a long course of years of careful study and actual experience in the drug store, fitted themselves for a like purpose. We have associated ourselves in this State Association, secured the passage of a State Pharmacy Law, and the appointment of a State Board for the examination of parties who desire to dispense medicines in our State, so that none but those who are fully competent may do so.

Now Gentlemen, after preparing ourselves in this thorough manner, are we capable of preparing and dispensing medicines, or are we not? It seems to me that by our actions, or rather want of action, we tacitly admit that we are not, but are ready to act as salesmen and fuglers, regardless of our own and the people's best interests, for any charlatan who sees fit to use us. To explain, come with me into any drug store in the State, (with a very few exceptions) and we will find that a large percentage of the stock consists of packages covered with labels and wrappers similar to this:

LITERAL COPY EXCEPT A FEW DISEASES LEFT OUT.

"This wonderful medicine will be found to surpass everything before discovered for the cure of all severe, acute, chronic or lingering coughs. Bronchitis, Laryngitis, Consumption, Ulcerated Throat, Ministers' or Public Speakers' Sore Throat, Hoarseness and Suppression or Loss of Voice, it does not debilitate the stomach or system as other medicines do; but on the contrary it improves the

digestion, strengthens the stomach, and invigorates and purifies the whole system. As a remedy for Torpor of the Liver, Liver Complaint or Biliousness and for Habitual Constipation of the Bowels it has no equal, for Loss of Appetite, Indigestion and Dyspepsia, and for General Nervous Debility it is a very superior medicine. As an Alterative or Blood Purifier this medicine is far superior to any preparation of Sarsaparilla, Iodide of Potassium, *or any other medicine or combination of remedies known to the Medical Profession*, it is therefore very valuable in all forms of Scrofulous Diseases, also for all Skin Diseases, Eruptions, Pimples, Rashes and Blotches, Boils, Ulcers, Sores and Swellings are cured by the use of a few bottles of this medicine."

These are facts that stare us in the face from every bill board and dead wall, it is flaunted in our face every time we pick up a paper, drug journal or periodical, and with our Schools, our Pharmacy Laws, our Examinations, and all our advantages, we allow ourselves to be forced into the position as sellers (and by so doing to a certain extent sanctioning) of any truck that any charlatan may offer and advertise.

Gentlemen: Is it not time that the educated and respectable Pharmacists rise in their might and put their heel squarely on the neck of "Scotch Oats Essence" and the whole disreputable brood of cure alls?

You ask me for a remedy; allow me to suggest the outline of a plan that it seems to me can be carried, if the "Michigan State Pharmaceutical Association" will take hold of it with vigor. Let us secure the passage of a State Law that will require the maker of any preparation for medical use, the formula for which is not contained in the United States Pharmacopœa, to put the exact formula for such preparation on the label attached to the package containing the goods, in addition have a competent person or persons, under authority of the law, before whom the maker of the preparation shall appear and make a sample, proving that it is true to formula, and allow no preparation for medical use to be sold in this State without meeting these requirements, and having the seal of the examining officer or board attached to each package.

To prevent the cry of expense and additional boards or officers, let the State University be utilized, have the formulas verified before the Professors in the School of Pharmacy, who shall have the power to attach the seal, and if at any time an analysis is required let the work be done there.

In the minutes of the meetings of the Secretaries of State As-

sociations, held in Cincinnati last year, are several suggestions in regard to State Associations, which our Secretary will present to you. The suggestion that State Associations be organized so that every Registered Pharmacist must become a member, seems to me a good one. I hope some action will be taken by you at this time with that end in view.

The adulteration of drugs and articles of food is a monstrous evil, one that we should make strenuous efforts to correct, for who shall the people look to for help in these matters, if not to the Chemist and Pharmacist.

The question of the sale of liquors by druggists for unlawful purposes, is one like "Banquo's Ghost" will not down. We have put ourselves on record as opposed to such sale, and ready to help prosecute any druggist found disobeying the law.

But while there are many ready to say that a large percentage of the druggists disobey the law, none seem willing to make a specific charge that can be acted upon. It is only a few days ago that the writer, while in conversation with the late Speaker of the State Legislature, who affirmed that at least one-half of the druggists of our State sold liquor by the drink, offered to pay the expense of securing evidence and making complaint against any druggist he would find doing so, and then see that such druggists were brought under the effects of the law if possible. He refused to make complaint, thus proving to me at least that he was not sincere in his charge, or lacked the courage to live up to his convictions.

Our State Board of Pharmacy are doing all they can to see that the Registration law is lived up to, but the same difficulty exists here as in the liquor question. No one wants to complain, even if he knows of a party doing business contrary to the law. What is the use of our having the law if it is not enforced, and who is going to see that it is enforced if we who are interested do not?

Gentlemen, if any one of you knows of a man in the State of Michigan who is selling drugs contrary to the Registration law, let the Pharmacy Board know of it and they will attend to his case at once.

We ought to have twice the membership we have now, considering the material we have in the State. Will not each member appoint himself a committee of one, and secure a new member during the coming year.

The program for our meeting is so arranged that the sessions for business will not be long or tiresome. It is very much pleasanter for us all when we have a full attendance. I trust that all

will feel under obligations to be present at all the business sessions.

In conclusion, allow me to tender my warmest thanks for the manner in which you have treated me during my term of office. I retire with none but the kindest feelings towards every member of our Association.

If I have performed my duties well, I am amply repaid; if illy, I trust to atone for it in the future.

MR. GUNDRUM: I move that the address be accepted and be referred to a committee of three, to be appointed by the Chair, to consider the recommendations and report the same to the Association.

The motion was seconded by Mr. Jesson, and prevailed.

PRESIDENT: The Chair will name Mr. Gundrum, of Ionia; Mr. Wurzburg, of Grand Rapids; and Mr. Latimer, of Ludington.

President Bassett then resumed the Chair.

PRESIDENT: The next order of business will be the report of the Committee on Trade Interests. Mr. Wurzburg is Chairman of that Committee.

MR. WURZBURG: I beg leave to submit the following report on behalf of the Committee on Trade Interests:

REPORT OF COMMITTEE ON TRADE INTERESTS.

In presenting this report on trade matter your committee have deemed it proper to refer to the influence of State legislation, regulating the business of the pharmacist: such legislation has been of incalculable benefit to our profession and also to the public. A much higher order of intelligence in the responsible duties of the pharmacist has been attained. His relation to the physician has thus been more intimately secured, and his services to the public have thereby become more valuable through a conscientious and intelligent direction of his efforts to attain a higher standard, brought about by the action of legislative enactments requiring examination into his fitness before engaging in his responsible duties. It is gratifying to your committee to state, now that the experimental period has passed, that the laws bearing on the subject of pharmacy have been found so practical and necessary, that their enforcement

has created no opposition on the part of the general public, and it has thus been demonstrated that their necessity is in accordance with the greatest of all laws—public sentiment. The pharmacist, in compliance with custom, extending through many years, is expected to serve the public with various necessary and useful merchandise. The subject of "trade matters" thus becomes an important factor in his calling. To solve the various problems that are presented to him through the medium of his patrons, Physicians, the manufacturing chemists, as well as the proprietary medicine manufacturers, is of a character to call for discriminating judgment in order to reconcile conflicting interests, and to prevent injustice.

1st.—The property right of the patient or physician in a prescription.

2d.—The habit of many physicians of furnishing their own medicines, such medicines frequently purchased from the jobber or retailer at wholesale.

3d.—The enormous quantities of what is known as the products of the manufacturing chemists, forced upon the retailer through the medium of the physicians who are influenced by adroit advertising reports, in medical miscellany, or personal visitation of the agent with samples.

4th.—The contract plan for the sale of proprietary medicines.

All these are subjects of the greatest importance, and a frank and free discussion will assist their correct solution.

Your Committee would recommend to their brother laborers, the discouragement of the sale of such patent medicines as are liable to inflict positive injury to the public. The article known as Bucklen's Essence of Scotch Oats, your Committee believe to be of this class. From analysis published in the newspapers it appears that this article contains morphia, while its advertisements urge it upon the public as a cure for the morphia habit, insomania, etc.

The appalling consequences of the morphine habit are too well known to us to require comment; and the sale to an unsuspecting public of an article so fraught with misery should be made a misdemeanor by law.

Your Committee would likewise denounce the sale of whiskies bottled for medicinal use, bearing labels recommending them for the cure of dyspepsia, nervousness, etc. In their real garb we know them, but false pretensions leads the patient into evils that he knows not of.

Duffey's Malt Whiskey may be claimed as an application of the above argument.

In our responsible duties we are liable by action at law both for our own mistake in dispensing, and also those of the physician in his nomenclature. To what extent we may be justified in literally following the text in an erroneous prescription, the proper method of having such errors corrected, and of preventing the knowlege of such errors reaching the patient, thereby injuring the physician, are fit subjects for thought and reflection, because we are frequently called upon to exercise nice discrimination in emergencies of this character.

The practice of some manufacturers of printing a retail price upon the label, and subjecting the pharmacist to a wholesale charge, [through the jobber], approximating closely to the advertised price, is an injustice. Reference is here made to some of the Syrups, Elixers, etc., of the New York Pharmacal Co., which cost the pharmacist $12.00 per dozen, leaving a margin of 25 cents a bottle to be secured by installments at his prescription counter. The jobber of these goods is allowed $10.00 on 100 ℔ lots, $5.00 on 50 ℔ lots. This tendency of some manufacturers to absorb all the profits should be condemned.

The ueed of greater harmony and the promotion of more friendly feelings between pharmacists located in the smaller towns and cities is to be urged with the energy that the subject demands. The larger cities have their associations, which bring the members into close contact, and their influence tends to promote kindly interests, cement friendships, and brush away the asperities that come to "two of a trade." But the smaller towns have no such advantages, individuality is more marked, and trade friction more severe, and the territory more limited.

These causes tend toward bitter competition between the pharmacist on one hand and depreciation, or in many instances the entire brushing away of profits, on the other, a condition of things to be deplored, both as unfortunate for the pharmacist and also to thc public.

The remedy is simple: In union there is strength. Let each cast aside the unpleasant and unprofitable experiences of the past, consult and confer on the subjects of mutual interests, and faithfully stand by such conclusions as may best seem to promote their general welfare.

The public will thus be better served and the remuneration for responsible labor be more adequate.

Mr. Jesson moved that the report of the Committee be accepted, and be taken up for discussion seriatim, at a future session, which motion prevailed.

PRESIDENT: The next order of business will be the reading of papers. Dr. Prescott is now with us and ready to present several papers. Before we pass to the consideration of the papers I wish to say just a word in reference to our proceedings. There is no one thing that tends to make a meeting so interesting and useful as a full discussion of papers that are presented before us. There is no one on this floor who is not able to say something on the subject presented, and each one should feel that it is his duty to express himself upon these subjects. We hope to take as little time as possible in the reading of the papers, and trust that we shall be able to present in a condensed form, through the reader, the subject matter of each paper, by this means giving time for proper discussion and an opportunity for all to be heard.

PROF. PRESCOTT: I take the liberty of giving notice that the question box is open in this part of the room and we should be glad if any member desiring to bring questions before the meeting for discussion would make use of this question box at any time.

PROF. PRESCOTT: Will you allow me to interrupt the proceedings a moment to say that Dr. Frederick Hoffmann of New York is present with us here this afternoon, and I hope he will be invited to the stand and requested to speak to us.

Dr. Hoffmann was then invited to the platform by the President, and thanked the Association for the compliment conferred upon him, and said he didn't desire to interrupt the proceedings by extended remarks.

PRESIDENT: Gentlemen, we have present with us today Dr. S. P. Duffield, whom we elected an honorary

member of this Association last year. The Doctor has kindly consented to make a few remarks to us, and I am sure we shall listen to him with pleasure.

Dr. Duffield was cordially welcomed and spoke as follows:

Gentlemen, I should first thank you for the honor you have conferred upon me. Only he who has stood behind the mortar and handed out five cents worth of castor oil and has seen his profits disappear in response to the request to have "a little oil of peppermint put in on top of it," can appreciate the struggles and difficulties of the drug business. But what to me is the greatest imaginable gratification is that Michigan has risen to her present position as regards her registered pharmacists.

Through the efforts of the Michigan Association the standard has been so raised in this city, that a gentleman, only a few minutes ago in the exhibition room, told me that they were driving all the unregistered ones over into his State, and I told him that was the greatest gratification Michigan men could have. I know a physician in this city who is not a registered pharmacist who attempts to keep a drug store, but he cannot keep that store himself. Under your present law he is compelled to have a registered pharmacist in his store. It is perfectly right and as it should be, and with the great expanse of medicine opened to us it is impossible for us to be everything, and therefore we must have a class of educated men to aid and abet our efforts by offering to us preparations that are rightly prepared.

The department at Ann Arbor is educating each consecutive class to be able to make microscopical and chemical analyses, and not only that, but also by experiments and analysis to test the strength and purity and efficacy of drugs. Such a thing was never thought of in 1857. We never dreamed of it any more than of the telephone, but to-day it brings to us the solution of alkalodial principles and puts into our hands something we can depend on, and we do not have to experiment for five or six or seven hours with tinctures and unreliable fluid extracts, to get the effects of a drug and then fail to get it. We can depend upon a certain strength and act upon it.

Gentlemen, I congratulate you that you have reached the very point you have desired to reach, and that I desired to reach when I started out in Michigan many years ago, as Prof. Prescott can cer-

tify. I put money into the effort and saw it fade away in trying to educate people up to the true standard of drugs. It should be a matter distinctly understood that all goods should be according to the Pharmacopœia and brought up to the standard, and then we will have a reliable standard to which all must come. In less than five years I believe we shall have reached that point where every man who issues a fluid extract must certify the alkaloidal strength of that extract and then we will know what we have. The science of pharmacy to-day educates you to be more than mere druggists, and it is as it should be. It is the healing art united with chemistry which is the right hand of medicine, and I bid you Godspeed in your efforts.

PRESIDENT: Mr. Gundrum desires to be relieved from acting upon the Committee on President's Address, and I will place upon that committee, to fill the vacancy, Mr. Wells.

PROF. PRESCOTT: I desire to request any of the members who have voluntary papers, who have not notified the Committee on Papers and Queries to do so any time. Any paper, however brief, will be acceptable.

MR. STEVENS: I would like to call the attention of the Association to the National Formulary Exhibit in the exhibition hall. There is no one there to explain the exhibit, but the preparations were sent here and Dr. Rice requested me to place them in the room. I did so expecting he would have some one here to look after them. The preparations are made up by the different members of the National Formulary Committee and are supposed to be made in strict accordance with the formulæ published in the book, and if there are any of them that are not as they should be it is the fault of the formulary. As a whole I think the preparations are very fine, and I would like you to see what has been done in that line. They are preparations not in the pharmacopœia.

MR. PARKILL: We have with us Mr. Smith, President of the Illinois Pharmaceutical Association and I should be glad to have Mr. Smith invited to the stand.

Mr. Smith having been invited to the stand by the President, spoke as follows:

I did not come here with the intention of making any speech, and I certainly hoped that I would not be recognized by you as President of the Illinois Pharmaceutical Association. Not that I am not glad to look upon your body and come here to sit with you in your deliberations, and to learn, if I can, something of the wisdom you are giving out here. I am not a speech-maker, and will not take up much of your time. I simply want to say it gives me great pleasure to meet with the pharmaceutical associations of other States, and when I look upon your Association and think of the facilities you have in your State, the reputation of having one of the best pharmaceutical colleges in this country, I think you are very fortunate indeed. In the town of Decatur, in central Illinois, where I reside, we have an institution in which there are a number of students who have attended your college, and I have learned in my visits over the country that your college is known everywhere and ranks as one of the highest.

As to pharmaceutical education we all recognize that we live in an age when it is demanded. The young man who goes to a pharmacist to-day for a situation, if he expects to occupy a prominent position in the store, must be a graduate in pharmacy. We have seen the great developments in pharmacy in the last few years and it seems to me to be fully abreast, if not ahead, of other branches of the profession, and the reason is that we are developing a higher standard of education.

The last meeting of our Association at Peoria was the best we ever had. It was a success socially and full of interest. We have taken some steps in pharmacy that seem to me to be in advance of anything that has yet been done. The Chicago College of Pharmacy has offered to our State Association its college, which is an institution which is valued at from $25,000 to $30,000. The idea of the Illinois pharmacists is, that in order to bring pharmaceutical education to its highest standard, the Pharmaceutical Association should be made the highest institution in the State, and that all colleges and institutions connected with pharmacy in the State should be subordinate to that association. Hence they have tendered us this gift. We have not accepted it as yet, although we have a committee that is very carefully considering the matter.

In pharmacy, as well as in all other professions, we have contending elements. In our profession we have also the mercantile

element, which is the bread and butter side of the business. We all recognize that a pharmaceutical knowledge is not sufficient alone to make a business successful. One may be ever so fine a pharmacist, he may be a scholar, and yet may fail in the mercantile business; hence, we are called upon to unite two elements, the element of education and that of business discipline. We must run our business upon principles that will make it win, or pharmaceutical education is worth nothing to us.

Thanking you, gentlemen, for the honor you have conferred upon me by calling me to address you, I express the hope that at our next meeting at Quincy, we shall meet a delegation from your state, which will result in mutual benefit.

PROF. PRESCOTT: I desire on the part of the School of Pharmacy to gratefully acknowledge the kind and encouraging words of the President of the Illinois Association. He speaks of the excellent meeting that the Association has had in a sister State. Looking over the minutes of that meeting, as given in the journals, I was very greatly encouraged, as I have been by his remarks here this afternoon, to see that the report of the committee upon pharmaceutical education reported to the effect that the colleges of pharmacy should maintain at least two terms of nine months each. I think the extent of the course of instruction in such education should be defined, and I desire to give my word of approval for this stand of the Illinois Pharmaceutical Association, and I believe it to be the wisest advance yet taken by any association for the encouragement of pharmaceutical education in this country.

PRESIDENT: The question box will now be opened.

MR. EBERBACH: "How would you construe before or after blank drachm mark?" I presume the drift of this question is that some pharmacist has received a prescription in which the denomination of weight or measure was given, but no quantity.

MR. DUPONT: In my opinion it would depend a great deal upon the nature of the article desired in the prescrip-

tion. If it was not convenient to see the physician you would be required to use your own judgment. If it was a very simple prescription, and if you knew the age or condition of the patient you might in your own judgment put in one drachm, one grain, or one ounce, as the case would allow. Otherwise you would certainly have to refer to the physician.

PROF. PRESCOTT: There is a question here which the committee thinks is not one which concerns us, but rather a question of individual differences among manufacturers. However it might be construed as one of general interest. "Why is it McKesson & Robbins' pills, gelatine coated, are of a darker color than the same pill made by P. D. & Co.?" I presume the pharmacopœal pill is understood in both cases to be properly defined by a pharmacopœal pill.

PRESIDENT: I think that is a question none of us could answer except McKesson & Robbins.

MR. EBERBACH: The question arises, which is made according to the U. S. Pharmacopœia? Are either of them made according to the U. S. Pharmacopœia authority, or any of them?

PROF. PRESCOTT: We have had some very pleasant and profitable interruptions this afternoon. If I am not mistaken we have with us another representative of the Illinois Pharmaceutical Association, who is well known as a teacher and writer on pharmacy, Prof. Oscar Oldberg, and I would like to hear from him.

Prof. Oldberg was then invited by the President to address the Association and replied as follows:

I am very much pleased indeed to meet with our neighbors and friends. I have very often taken pleasure in looking over your proceedings as published. They speak volumes for the Michigan Pharmaceutical Association and for the enthusiasm with which you are all inspired in your profession. They say that "all roads

lead to Rome." I believe it is often true, and it leads me to say, as many other of your visitors have said before me, that you have in this State one of the best pharmaceutical schools in the world perhaps. If it is not *the* best, it is certainly *one* of the best, and I take it that it is because of the excellence of that school that you are so successful. You stand shoulder to shoulder and support your school of pharmacy, and in that way you are enabled to contribute largely to the advance and progress that is made in the profession which we all so much love. I am not a speaker, gentlemen, and therefore I will not weary you with any extended remarks, simply expressing my thanks for the opportunity of meeting with you.

PRESIDENT: I desire to state that I have an invitation to this Association from the Michiga Anmmonia Works to visit their works at any time during our session.

PROF. PRESCOTT: I see, Mr. President, that we have with us the President of a sister State Association, the Pharmaceutical Association of the State of Indiana, Prof. Green, known to many of us, and I think we would like to hear from him.

Prof. Green was invited to the stand and spoke as follows:

It is with some diffidence that I arise to say anything this afternoon, not expecting to be called upon. I am glad, however, to be here and it seems like home to come back to Michigan, where I was under the instruction of Prof. Prescott in the School of Pharmacy for half a dozen years. When we think of the Michigan State Association we also think of the School of Pharmacy at Ann Arbor, in some way they seem to go together. Away from home the Michigan School of Pharmacy is a synonym for thorough education, and even though I am connected with another school, it has not been ten minutes since I said I believed the Ann Arbor school was the best school of its kind in the United States.

Everyone knows how successful you were in having a law passed, and that is the thing we are after in Indiana. You all know, and think of us as the pharmaceutical waste basket for all persons who cannot practice in any other place, but we hope it will not be so after next year. We have things in pretty good shape and expect to have a law passed at the next session of the legislature.

PRESIDENT: You are probably aware there is to be a joint meeting of the two Associations this evening, which will be held in the room where the American Association hold their session. There will be a number of papers presented at that meeting upon Trade Interests, and the meeting is purely for a consideration of questions of commercial interests, and I hope you will all be there.

The Association then adjourned until 9 o'clock to-morrow.

THIRD SESSION.

WEDNESDAY MORNING, SEPT. 5TH, 1888.

At 9 o'clock A. M. the Association was called to order by the President who announced that the first business of the morning was the report of the officers and committees.

MR. JESSON: I move, while we are waiting for the reports of the officers and committees, that the paper read by Mr. Wells last night before the joint meeting be printed in our proceedings. It seems to me it was a very valuable report, and I would like to see it incorporated in the regular proceedings of the Association.

The motion was carried.

PRESIDENT: We will listen to the report of the treasurer.

DETROIT, Sept. 5th, 1888.

TREASURER'S REPORT.

1887.		RECEIPTS.		
July 14.	To balance on hand			$ 523 31
"	" cash	$ 62 00		
"	" "	36 00		
Oct. 29.	" "	30 00		
Nov. 2.	" "	25 00		
Dec. 2.	" "	236 75		
5.	" "	1 00		
27.	" "	22 75		

1888.					
Apr. 19.	"	"		100 00	
June 1.	"	"		90 00	
Sept. 4.	"	"		545 00	
"	"	"		102 20	
					1250 70
					$ 1774 01

DISBURSEMENTS.

1887.						
July 14.	No. 1,	By paid	S. E. Parkill	$ 200 00		
"	2,	"	" Owosso Press	14 88		
"	3,	"	" Frank Wells	10 00		
"	4,	"	" Owosso Times	20 75		
"	5,	"	" Fuller & Stowe	1 75		
28.	6,	"	" Guy Harwood	50 00		
Aug. 8.	7,	"	" " "	15 00		
20.	8,	"	" H. Whitaker	75 00		
"	9,	"	" S. E. Parkill	5 15		
Sept. 2.	10,	"	" H. J. Brown	12 00		
"	11,	"	" Frank Wells	2 75		
15.	12,	"	" Times Printing Co.	30 10		
Dec. 6.	13,	"	" D. O. Haines & Co.	456 20		
27.	14,	"	" S. E. Parkill	42 75		
1888.						
Apr. 19.	15,	"	" A. B. Lyons	75 00		
July 26.	16,	"	" Times Printing Co	8 50		
Sept. 4.	17,	"	" S. E. Parkill	102 20		
"	18,	"	" Owosso Press	19 00		
						1141 03
			Balance on hand			632 98
						$1774 01

RECAPITULATION.

Amount on hand July 14th, 1887	$ 523 31
" received since	1250 70
	$1774 01
Amount paid out	1141 03
Balance	$632 98

Respectfully submitted,

WM. DUPONT, *Treasurer.*

PRESIDENT: You have heard the report of the treasurer. What is your pleasure in regard to it?

MR. BROWN: I move that it be referred to the Executive Committee, to be audited.

The report was so referred.

SECRETARY: I have here the credentials of the delegates from the National Wholesale Druggists' Association.

PRESIDENT: Gentlemen, we have with us T. H. Hinchman, who is Chairman of this delegation, and we should be very much pleased to hear from him.

Mr. Hinchman addressed the Association as follows:

The National Wholesale Druggists' Association have appointed a Committee to represent that body at the meeting of the Michigan State Pharmaceutical Association. The members of the committee are T. H. Hinchman, W. C. Williams, Jas. E. Davis and George J. Seabury. As Chairman, it is my pleasant duty to convey to the Association the greetings and good wishes of the National Wholesale Association.

It is fully recognized that the interests of the wholesaler is dependent upon the success of the retailer. Their business relations must be conducted so that the retailer shall have a fair profit, and benefits must be mutual. Formerly there was more direct intercourse without intervention. Then the expenses of business were but one-third, or one-half of the present rate. Both parties prospered. That was changed by the cupidity of the jobber until the sale of drugs has become exceedingly expensive—averaging about all that had previously been required as gross profit. Redress was sought about eleven years since and the Western Wholesale Druggists' Association was a result. That continued five years, and was then changed into the National Association, which includes almost every wholesale drug house as members, and numerous associates, in paint, oil, sundry, glass-ware, proprietary goods, and importing houses. It is an influential and powerful Association with a strong membership, and a fair degree of legislative, and a large measure of business talent. The twelve standing committees of the Wholesale Association have at each annual meeting presented reports that were valuable; especially the committees on the Drug Market; Legislation; Adulteration; Fire Insurance, and Proprietary Goods.

The committees on legislation have from year to year recommended a repeal of the excise on alcohol and spirits. In this they have exceeded their mission—had they limited their efforts to a removal of the excise from alcohol used in the arts and for medicinal purposes better success might have been secured. The efforts of their committee on adulterations it is to be hoped, has been the means of securing greater purity in drugs. The subject of fire insurance has been presented many years with many statistics. It was finally resolved to organize a company in Philadelphia, now known as the Druggists' Mutual Insurance Co., with subscribed capital and no liability to the insured. The Company has been doing business eleven months, and insures all property of less hazard than drug stocks.

The committee on proprietary goods succeed in effecting a contract system with proprietary manufacturies by which a rebate is allowed sufficient for the cost of selling. Before this was effected such goods were sold at a loss to the jobber. The interest of the retailer was kept in view. No goods were sold at higher prices, excepting two, out of many hundred, and the quantities to be purchased were in some instances lessened.

I congratulate the Michigan State Association on its success in disseminating information, in correcting irregularity, in its efforts in influencing legislation, and also in the social advantages derived.

The Wholesale Association will be pleased to co-operate in all that will tend to mutual advantage, and invites suggestions and requests for that purpose.

Wishing that all objects sought for your advancement may be attained, and that the Michigan State Association may enjoy many years of uninterrupted progress and prosperity, I thank you for this privilege.

MR. WELLS: Mr. Hinchman, I would like to inquire more particularly in regard to this company. Is it intended for the accommodation of retailers as well as of the wholesalers, and whether its advantages would be open to the retailers of Michigan?

MR. HINCHMAN: I should have stated that the first object was to insure wholesale drug stocks. They then included retail drug stocks, and finally we concluded to insure all property like drug stocks. The company has no agency in this State, and cannot have at present, but any

person wishing insurance can obtain it by writing to their secretary, Mr. E. R. Hunt, of Philadelphia, Pa.

MR. WELLS: As I understand the plan of the company, risks are taken at a local rate?

MR. HINCHMAN: Yes.

MR. WELLS: And the party insuring has a portion of the profit commensurate with the amount of premium paid?

MR. HINCHMAN: Yes.

MR. WELLS: He pays the same, though, as charged by the underwriters in the locality where the risk is?

MR. HINCHMAN: Yes.

MR. WELLS: The reason I make these inquiries is, because it seems to me from what I know of this organization, it may fill all the requirements of the organization we have proposed. This subject of insurance has arisen quite frequently in our meetings, and if the National Wholesale Druggists' Association has an insurance organization that is in working order, and the druggists of this State can avail themselves of its benefits, I can see no reason why we should have a separate organization.

MR. HINCHMAN: That company is in the hands of the very best gentlemen in the drug business in Pennsylvania. Mr. Shoemaker, of Pennsylvania, is the President, and there are nine directors, who are wholesale druggists in Pennsylvania, Mr. George A. Kelly amongst the others. I have had a great deal of correspondence with the company, and am pretty well acquainted with the manner of their doing business. I know they are extremely careful and conservative in doing their business. Of course if a risk is not considered a safe one, they would feel bound to reject it.

MR. BROWN: I would like to ask Mr. Hinchman if

they have no local agent to examine into the character of the risk, how they can know whether a risk is a safe one?

MR. HINCHMAN: They have a system of inspection. When they have an application, if it is from a remote place, they send an inspector to examine it, who reports to them, and action is then taken.

MR. BROWN: I knew that was so of the wholesale trade, but I questioned whether it was so with reference to other risks.

MR. TODD: I would like to ask whether this association would insure a manufacturing chemist, or mauufacturing pharmacist, as well as wholesale and retail dealers?

MR. HINCHMAN: Yes, if the risk was not considered any greater than upon a wholesale drug stock.

MR. CALDWELL: Is there any limit to the amount.

MR. HINCHMAN: The maximum is $10,000.

MR. CALDWELL: In case of a good many losses at one time, amounting to one or two hundred thousand dollars, how would they pay it?

MR. HINCHMAN: They have $100,000 subscribed. There is no liability on the part of the insurers in this company. Each one has subscribed to the capital stock, which so far has been ample security. In one of these companies where the losses were pretty large there was additional capital put in. But it is positive there can be no claim on the insured to pay for large losses.

MR. WELLS: Do the profits of the original stockholders in this association consist entirely of the interest that is paid them, or do they have an additional interest aside from that?

MR. HINCHMAN: They are receiving 6% on the amount advanced, and 10% of the net profits in addition.

MR. WELLS: And the remainder of the profits is divided among the insurers?

MR. HINCHMAN: Yes. For three or four years I was Chairman of the Committee on Fire Insurance, and of course I gathered up all the information that could be had upon the subject. I found the average expenses of stock companies was about 40% for doing business, and if the losses reached more than 50% of the amount of premium received, the old stock companies claimed they made nothing. In organizing this company, not having any agencies, and not having any extraordinary expenses it was calculated that the expenses of the business would be cut down 15% or 17%, and you will perceive that is a very great saving, which is entirely to the advantage of the insured.

MR. WELLS: Is there any method of investigating risks?

MR. HINCHMAN: They have their inspectors who are sent out, and I presume the rate will be fixed according to the report of their inspectors. The adoption of the rate of the old stock companies is not considered to be entirely permanent. It was adopted as a matter of convenience for the first year, and it may be changed at the annual meeting.

MR. BROWN: If it is in order I would like to make a suggestion with reference to this matter that may be of some benefit to the members of the Association. For a great many years I paid insurance at the rate of $1.35, and a dry goods store next door to me had insurance for about 90 cents on the hundred, and I felt it was unjust that I should pay a higher rate. I carried no benzine, nor paints and oils, and I did not consider my risk any more hazardous than the dry good store. I complained without effect to the local agent, and finally I insisted on having their inspector come and look over the property. I said, if

there is anything about the building that can be improved to make the rate lower, we will have it done. The result was, that he came on and suggested some changes in the upper part of the building, which we had made at a cost of $25 or $30, and it resulted in getting my rate reduced to $1.15.

Mr. PARKILL: We have received the credentials of C. A. Strathman and of O. Oldburg of the Illinois Association, signed by the Secretary and President. I would like to inquire if there are any other delegates from any other State association present who have credentials.

Mr. WELLS: I would like to make a motion that delegates from kindred associations, who may be present, be invited to meet with us and take part in our discussions of such subjects as we may have before us.

The motion prevailed.

PRESIDENT: The next thing in order will be the reports of officers. We will now hear the report of the Secretary.

SECRETARY'S REPORT.

To the Officers and Members of the Michigan State Pharmaceutical Association:

Your Secretary respectfully submits the following report for the year ending Sept. 5th, 1888:

Following the instructions of the last Convention, a copy of Mr. Eberbach's paper on the relation of the apprentice in a drug store to his employer, was mailed to each drug firm in the State. The Proceedings were sent out in October, and a copy mailed to each member not more than a year in arrears for dues. We have received many complimentary letters from all parts of the country congratulating the Association on its work as exhibited therein.

Your Secretary attended the Conference of State Secretaries at Cincinnati. Association affairs and management were freely discussed to the advantage of all present, and the following suggestions were adopted, with instructions to each Secretary present to present them to their several Associations at the next Annual Meetings:

1st. That State Associations issue transfer papers, signed by the President and Secretary, to all members in good standing who may remove to another State, entitling them to membership in that State's Association.

2d. That papers read at Annual Meetings be withheld from publication in journals until after the publication of the Proceedings.

3d. That some plan be devised by which every registered pharmacist shall of necessity become a member of the State Association, thereby increasing the usefulness and influence of the Association, and stimulating an interest in pharmaceutical affairs in many who are now indifferent.

During the year we have lost eight members by death, viz:

G. B. Dunn, Burr Oak.
Wm. Johnston, Detroit.
R. L. Latimer, Jackson.
J. D. Petrie, Kalamazoo.
H. T. Reed, White Cloud.
Theo. Runefeld, Detroit.
T. Rudolphi, Dowagiac.
Ezra Weaver, Reading.

The following have resigned:

J. F. Clark, Climax.
L. C. Fink, Detroit.
W. Jefts, Big Rapids.
C. W. Kotcher, Detroit.
C. W. Plaat, Grand Rapids.
A. B. Saltzer, Detroit.
W. H. Dodds, Detroit.

According to Article IV. of the By-Laws, the following have been dropped from the roll of members for non-payment of dues:

Augustus Ahlborn, Detroit.
S. N. Andrews, Flint.
Henry Arbour, Muir.
M. T. Arbour, Orange Mills.
A. W. Banks, Detroit.
H. F. Bannard, ————.
F. S. Barbour, Clifford.
G. W. Bence, Detroit.
H. B. Bessac, Milan.
C. F. Bigelow, Big Rapids.
O. Bolio, Detroit.
S. C. Buchanan, ————.
S. N. Clark, Grand Rapids.
L. K. Clark, Elsie.
W. O. Clark, Middleville.
A. C. Dahm, ————.
F. S. Davis, Ypsilanti.
G. L. Davis, Lansing.
W. M. Demorest, Webberville.
N. A. Dunning, Mason.
W. B. Falk, Howard City.
C. L. Frizelle, Detroit.
D. J. Gahan, Mt. Pleasant.
A. E. Gebhard, ————.
G. H. Graydon, ————.
A. L. Green, Lafayette, Ind.
P. D. Grommon, ————.
J. W. Hall, Hudson.
D. S. Harris, ————.
H. D. Harvey, Bangor.
H. C. Hedges, North Lansing.
F. H. Hendrick, Stanton.

C. H. Herrington, Belleville.
J. L. Hogle, Farmington.
James Hullinger, ————.
C. B. Hungerford, ————.
J. E. Hunter, ————.
W. J. Kay, Belmore, Ont.
E. H. Kenrick, Monroe.
F. E. Kipp, Grand Rapids.
A. B. Lee, Detroit.
H. Leonard, Muskegon.
J. H. Lobdell, Flat Rock.
B. W. Long, Portland.
E. F. McQueen, Detroit.
C. N. Miller, Dryden.
H. C. Neff, Detroit.
W. S. Nowell, Laingsburg.
A. Parker, Balch.
C. M. Peacock, Corunna.
W. B. Porter, Detroit.
J. A. Reck, N. Lansing.
Frank Row, ————.
Joseph Schaller, Dakota.
C. E. Schenck, ————.
A. L. Share, Kansas.
B. C. Shaw, ————.
S. B. Shaw, Marlette.
J. F. Smith, Ypsilanti.
M. W. Stewart, ————.
W. H. Teetzell, Detroit.
J. H. Wasson, Hoytville.
Daniel Weston, Buchanan.
Obed. Wheeler, Berrien Springs.
J. L. Wilkinson, ————.
A. H. Wilson, Grand Rapids.
W. A. Wilson, Dakota.
W. E. Wilson, Grand Ledge.
A. F. Withe, ————.
M. G. Woodward, Lake City.

We have dropped seventy for non-payment of dues. Some of these have moved into other States, some have gone out of business, and others have, perhaps, failed to receive notice of delinquency, because of failure to notify the Secretary of changes in residence, so the number who have lost interest in the Association is not as great as at first appears, and I think the Association is in better condition for active, aggressive work than it ever has been before, and we may look forward to a long career of usefulness and constantly increasing influence.

During the year we have received complimentary copies of the "American Drug Clerk's Journal," "American Pharmacist," "Druggists' Bulletin," "Myer Bros. Druggist," "National Druggist," "Michigan Tradesman," "Pharmaceutial Era," and "Rocky Mountain Druggist."

The receipts and disbursements for the year have been as follows:

CASH RECEIVED.

Initiation Fees, Dues and Certificates	$1,107 95	
Advertisements	140 00	
Sale of Proceedings	2 75	
		$1,250 70

CASH PAID.

1887.							
July	13.	To	William	Dupont,	Treasurer	$ 62 00	
"	14.	"	"	"	"	36 00	
Oct.	28.	"	"	"	"	30 00	
"	31.	"	"	"	"	25 00	
Dec.	1.	"	"	"	"	236 75	
"	6.	"	"	"	"	1 00	
"	26.	"	"	"	"	22 75	
1888.							
Apr.	17.	"	"	"	"	100 00	
May	31.	"	"	"	"	90 00	
Sept.	4.	"	"	"	"	545 00	
"	4.	"	"	"	"	102 20	
							$1,250 70

The following orders have been drawn:

	1887.				
1.	July	12.	S. E. Parkill, Salary	$200 00	
2.	"	12.	Owosso Press, Printing	14 88	
3.	"	12.	Frank Wells, Drawing Articles of Association	10 00	
4.	"	12.	Owosso Times, Printing	20 75	
5.	"	12.	Fuller, Stowe & Co., Printing	1 75	
6.	"	28.	G. M. Harwood	50 00	
7.	Aug.	4.	G. M. Harwood, Hall Rent	15 00	
8.	"	18.	H. Whitaker, Report	75 00	
9.	"	18.	S. E. Parkill, Express and Tickets	5 15	
10.	"	31.	H. J. Brown, Engrossing Certs.	12 00	
11.	"	31.	Frank Wells, Filing Articles of Association	2 75	
12.	Sept.	13.	Times Printing Co., Printing	30 10	
13.	Dec.	1.	D. O. Haynes & Co., Printing Proceedings and Reprints	456 20	
14.	"	7.	S. E. Parkill, Expense to A. P. A. $36.35; Supplies, Stationery etc., $6.40	42 75	
	1888.				
15.	Apr.	17.	A. B. Lyons, Salary as Editor	75 00	
16.	July	14.	Times Printing Co., Printing	8 50	
17.	Sept.	4.	S. E. Parkill, Supplies	102 20	
18.	"	3.	Owosso Press, Printing	19 00	
					$1,141 03

S. E. PARKILL, *Secretary.*

PRESIDENT: You have heard the report of the Secretary. What is your pleasure in regard to it?

On motion of Mr. Jesson, the report took the usual course.

PRESIDENT: The next thing is the report of the Committee on Trade Interests. Their report has been made, and it was to be taken up by sections and discussed.

MR. WURZBURG: The first section refers to the property right of the patient or physician in a prescription.

MR. BROWN: Does the committee make any report on that?

MR. WURZBURG: No, we would like to have the matter discussed. It has come up a great many times.

MR. BROWN: Then the question is whether the patient has the right to retain the original prescription or a copy?

MR. WURZBURG: Yes.

MR. CALDWELL: I think the prescription rightly belongs to the druggist. After the druggist has prepared it he wants to have something to show what he has done. I think it is his property. If they want the prescription I think the druggist ought to give a copy, unless the physician forbids it. I think the ownership of the prescription belongs to the one that prepares it.

MR. EBERBACH: This question has been brought before the Association repeatedly and there has been great diversity of opinion. I don't think it can ever be changed unless we have some law upon it. The physician claims the prescription as his property because he has the case under consideration and is responsible for it, and merely expresses his ideas in writing as to the remedies the patient should use, and for his own convenience he does not dispense it himself. That is the position the physician

takes. He claims it is his right to locate the prescription as he pleases; that he has the right to leave it with the druggist, in his care, or leave it with the patient. The patient takes the ground that it is his property because he paid for it. Now, the question is, did he pay merely for the advice and accept the prescription merely as a medium for the direction of the doctor through his co-laborer who puts it up? The third view, which is certainly most important to us, is the question as to holding the prescription. My own firm makes a practice of holding the prescriptions, unless the prescription is of an ordinary character where there is no danger. We take this ground, that our prescription file is the only safe place for the prescription in case of an accident. If we allow that prescription to go out of our hands and there was anything wrong on the part of the physician there would be an opportunity to destroy it and we have no evidence that it was not our fault. It is to our interest to hold the prescription and for that reason we should hold it.

MR. JESSON: I fully agree with Mr. Eberbach in his position and can instance a case where a prescription file was brought into court saving the doctor from the suspicion of a crime. A physician was sued for malpractice and one of the claims brought against him was that he neglected the patient, did not give him sufficient medicine to keep him alive. It was a case of fracture, however, and the physician had written a prescription which was brought into court and after arguing the case pro and con for a day the judge concluded to admit the prescription as evidence and it had a great effect upon the case.

DR. DUFFIELD: I am an honorary member of this Association. Would it be in order from the standpoint of the physician, as well as that of a former pharmacist, to make a remark on this question.

PRESIDENT: It is in order.

DR. DUFFIELD: I think Mr. Eberbach and the other gentleman are perfectly correct in insisting that the pharmacist should retain the original prescription, and I can certify from certain cases where I have made analysis in in this city, in cases that have been fatal, that had not the original prescription been kept on file the physician would have been shouldered with the responsibility of a death beyond a doubt. The original prescription should never go out of the druggist's file. If the patient wishes a copy let him have a copy, but he should retain the original prescription. It is absolutely essential.

You will find this principle fully discussed in the text books upon the rights of druggists and manufacturing chemists.

A prescription to-day may be proper, but the same prescription two weeks from to-day may be improper, and who is to judge of it? The physician. Now comes the question as to the property right of that prescription. That patient has the right to that prescription in my opinion, and in the estimation of many practicing physicians only for that time being, unless he goes back to the physician and asks him whether he shall repeat that prescription. We have got to defend the physician as well as the druggist, and my advice would be hold the original prescription. Then you are able to hold the doctor in case there is a mistake. It is your duty to protect the physician if he makes a mistake and not put up his prescription. At the same time, if it is put up, the mistake is shouldered upon the physician, and you have the original writing to show for it. If you give the original writing away you have only a copy to show and that copy does not weigh in court.

MR. BROWN: If the original prescription can be held without having trouble with the patient, of course it ought to be. I believe it ought to be held anyway, but there are cases where it seems advisable to return it.

MR. SACKETT: I move, as an expression of the pharmacists present, that we recommend that in all cases druggists should retain the original prescription.

MR. BROWN: I second the motion.

The motion prevailed unanimously.

PRESIDENT: Our program this morning includes the election of officers. As the time is approaching for the noon adjournment we will now lay aside further consideration of the report of the Committee on Trade Interests and proceed with the election of officers. We will take up this report again this afternoon, if we have time. The next order of business will be the election of officers.

On motion of Mr. Jesson that two tellers be appointed, the President appointed as such tellers Mr. Brown, of Ann Arbor, and Mr. Allen, of Detroit.

MR. BROWN: I move that we now proceed to an informal ballot for President.

Carried.

The ballot having been taken the tellers announced the following as the result of the informal ballot:

George Gundrum	11
Arthur Bassett	8
Jacob Jesson	7
Stanley E. Parkill	3
F. Allsdorf	2
H. J. Brown	2
Scattering	9

MR. WELLS: I now move that we proceed to a formal ballot.

Carried.

PRESIDENT: I want to say in this connection that I trust you will not vote for me for this office. I have had my turn at the crank and I think some one else ought to

take his turn. I certainly should not feel like taking it under any circumstances.

MR. JESSON: I desire to thank those seven persons who voted for me, but I will state that under no condition will I accept the office of President of this Association, so please don't vote for me again.

MR. WELLS: I would like to state to the members that there is one advantage to be secured by voting for one gentleman prominently named here, and that is his residence, it being near Lansing. Perhaps we may have another fight with the legislature, and if we do he is convenient to answer, that is Mr. Gundrum. He has other qualities that peculiarly recommend him for the position and his residence I urge as one good reason why he should be elected.

MR. DUPONT: I had hoped that nominations would be made before any ballot was taken, and in that case I should have offered the name of Mr. Gundrum. He has done a great deal of work for this Association and has done it willingly. If it is in order and the balloting has not commenced, I move that Mr. Gundrum be elected by acclamation.

MR. JESSON: I rise to a point of order, that the ballot having been ordered such a motion would not be in order.

CHAIR: I think the point is well taken. Proceed with the ballot for President.

The ballot having been taken, the tellers declared the result to be:

George Gundrum	36
A. Bassett	5
Scattering	3

Mr. Gundrum being called upon responded as follows:

Gentlemen: I desire to thank you for the honor you have conferred upon me. I am not much of a speech-

maker, but I will try to make up in work what I lack as a speech-maker. As Mr. Wells suggested, I am a little afraid that during the coming winter we will be required to do a little more work. Again thanking you, I will defer further remarks to some other occasion.

PRESIDENT: The next thing will be the election of three Vice-Presidents.

MR. JESSON: I move we proceed to a formal ballot in the following manner. The person receiving the highest number of ballots, to be the first Vice-President; the second highest, the second Vice-President; the third highest, the third Vice-President. This is the plan we have adopted several times, the three names to be placed on one slip of paper, and no two names to be alike.

The motion prevailed.

PRESIDENT: Nominations are in order.

SECRETARY: The constitution provides that any member in arrears for dues is not entitled to vote at the annual meeting. I am ready to take the dues at any time.

MR. BUGBEE: I nominate Henry M. Dean, of Niles, who is one of the ablest druggists in Michigan. I find that the extreme western portion of Michigan has not taken the interest in this Association that it should, and I think this will be the means of interesting them. Mr. Dean is not present, but I think he will make a good officer, and that he will interest himself, and it would bring to light some of the fossilized druggists down in Cass, VanBuren, and other counties.

MR. SACKETT: I nominate Mr. Eberbach, of Ann Arbor.

MR. WURZBURG: In nominating Mr. Peck, of Grand Rapids, I nominate one who has always taken a great interest in the State Association. He has done more for our local organization than any other man in it.

MR. JESSON: I nominate Mr. F. M. Allsdorf, of Lansing. As Mr. Wells says, he will probably have to attend somewhat to the legislature, and I know from Mr. Allsdorf's reputation that he is a fighter.

The ballot was then proceeded with and the tellers announced the following result:

F. M. Allsdorf	22
H. M. Dean	19
O. Eberbach	17

And they were declared duly elected.

PRESIDENT: We will now proceed to a ballot for Secretary.

On motion Stanley E. Parkill was unanimously elected Secretary.

PRESIDENT: I declare Mr. Parkill duly elected Secretary. Speeches are not in order.

MR. PARKILL: I supposed it was understood by a majority of the members present that I was not a candidate and would not accept. I am very much obliged for the compliment conveyed in my re-election, but it will not be possible for me to accept the office for another year. It takes up altogether too much of my time that is needed for other matters. I thank you for your expression of confidence in my work, but I must firmly and absolutely decline a re-election to this office.

PROF. PRESCOTT: I think we all regret this conclusion on the part of our Secretary. We are all aware of the value of his services to the Association, but I think we should accept his statement and yield to his wish to decline a re-election.

MR. WELLS: I arose to make a motion, but I don't know whether I will make it or not. This matter of Secretary of the Association is something we are all deeply interested in. We have been most fortunate in the selec-

tion of Secretaries heretofore, Mr. Jesson and Mr. Parkill, and I hope there will be no mistake in electing a successor to these gentlemen. I will make a motion, that the election of the Secretary be postponed until afternoon if it does not conflict with any order of business, to be taken up at 2 o'clock.

The motion prevailed.

PRESIDENT: We will now pass to the election of Treasurer.

MR. JESSON: I will nominate our old standby, William Dupont.

MR. DUPONT: Mr. President, Mr. Dupont will not be a candidate. I won't accept it. It is time some one else had it.

MR. GUNDRUM: Mr. Dupont did the same last year.

MR. JESSON: To my knowledge Mr. Dupont has done the same every year.

MR. DUPONT: I object on principle.

MR. WELLS: I move it be forced upon him.

MR. DUPONT: The principle governing all Associations, and I think it is a proper one, that the money should be transferred from one to another at least once in five years; and too, it might be an encouragement for some member to remain in the Association if it were passed around, for the purpose of becoming an officer.

MR. GUNDRUM: I think Mr. Dupont's reason is not a very good one.

MR. WURZBURG: I move that the Secretary be directed to cast a ballot for the Association for Mr. Dupont.

The motion prevailed.

MR. DUPONT: I had given warning to our worthy Secretary that under no circumstances would I accept the

office, but under these circumstances, and to save time, I will accept. (Laughter.)

PRESIDENT: The next thing will be the election of an Executive Committee, to consist of five members.

MR. BROWN: I nominate Mr. Lyman, of Manistee.

MR. JESSON: I nominate Mr. Hall, of Greenville.

MR. EBERBACH: I nominate Mr. E. T. Webb, of Jackson.

MR. WELLS: I will nominate Mr. Bassett as a member of that committee.

MR. JESSON: I nominate Mr. F. R. Wurzburg, of Grand Rapids.

The Association proceeded to a ballot with the following results:

Mr. Lyman	25
Mr. Bassett	23
Mr. Wurzburg	19
Mr. Hall	18
Mr. Webb	18

PRESIDENT: There is only one officer to be elected, and that is the Editor of the Proceedings. I think it would be advisable to leave that matter until the Secretary is elected, as the Secretary ought, in justice, to have something to say as to who should be the editor. If there is no objection the matter will be laid over until that time.

The Association then adjourned until two o'clock P. M.

AFTERNOON SESSION.

The meeting was called to order by the President.

PRESIDENT: The first business to be taken up this afternoon according to the understanding before adjournment, is the election of the Secretary and we are now ready for that business.

MR. BUGABEE: If it is in order, I will nominate H. J. Brown, of Ann Arbor.

The Association then proceeded to a ballot for Secretary with the following result:

26 votes cast, of which H. J. Brown received 14, the rest scattering.

MR. WELLS: I move that this be declared a formal ballot, and that Mr. Brown be declared elected. I believe he has a majority of all the votes cast.

The motion prevailed, and Mr. Brown was declared duly elected.

MR WELLS: I now congratulate the Society on having elected so good a man for Secretary for the next year, and I think it would be a good idea to have the two offices of Secretary and Editor of the Proceedings united. They were divided last year and Dr. Lyons was appointed Editor of the Proceedings and paid $75, while the Secretary was paid $150 salary. I move therefore that the Secretary, Mr. Brown, be elected Editor and that we combine both offices in one, he to receive the salary of both and to arrange for the editing of the Proceedings as he chooses.

Carried.

MR. WELLS: I move that the salary of the Secretary for the next year be fixed at $225.

Carried.

MR. PARKILL: As there is nothing particularly before the Association at present, I will say we have present with us here Mr. Hogan, Secretary of the Illinois Pharmaceutical Association. I think the Association would like very much to hear a few words from Mr. Hogan.

Mr. Hogan upon being invited to the stand spoke as follows:

Mr. President, and members of the Michigan Pharmaceutical As-

sociation.—I was in hopes that I had got so far back that Mr. Parkill would not see me. At our last meeting, held in Peoria, we had the best attended meeting we have ever had, and I think the most important one. We have reorganized, and I think we now have the largest Association in the country, something like 3800 members. We intend to revise our pharmacy law so that it will cover the ground. It has been said by some of the Secretaries of the different State Associations that they thought this proceeding was unconstitutional and they could not get the law changed, but it is a well known fact that when Chicago wants anything, (and Chicago means Illinois,) she gets it. All she has to say is that she wants it, and it comes. I thank you for the courtesy you have shown me.

PRESIDENT: The next thing in order will be the report from the Secretary of the State Board of Pharmacy:

ABSTRACT OF THE REPORT OF THE SECRETARY OF THE STATE BOARD OF PHARMACY FOR THE YEAR ENDING JULY 1ST, 1888.

Three regular and three special meetings were held during the year, as follows: At Petoskey, July 14th and 15th; at Kalamazoo, Oct. 24th; at Lansing, Nov. 1st, 2d and 3d, 1887; at Owosso, January 24th; at Grand Rapids, March 6th, 7th, 8th and 9th; at Star Island, June 29th and 30th, July 2d and 3d, 1888. At the Petoskey meeting two candidates passed; four failed. At the Lansing meeting 31 candidates passed; twenty failed. At the Grand Rapids meeting 52 candidates passed; 25 failed. At the Star Island meeting 51 candidates passed; 42 failed. Total number examined, 227; of which 136 passed, and 91 failed. Total number of certificates in force, 3,065; of which 230 are Assistant Pharmacists. 163 names were dropped from the Register during the year for non-payment of fees. The cash receipts were as follows:

For renewals, Registered Pharmacists	$2,584 00
" " " Assistants	69 50
" 73 registered under amendment	146 00
" 79 Assistant's applications for examination	79 00
" 185 Registered Pharmacists' applications for examination, at $3.00	555 00
Total receipts	$3,433 50

The Treasurer's books show the following:

July 8th, 1887, cash on hand	$1,847 18	
received from Secretary,	3,433 50	
Total	$ 5,280 68	
The running expenses for the year were		$ 3,478 39
Deposited with the Treasurer of the State		1,000 00
Balance in hands of Treasurer		802 29
		$ 5,280 68

The Board has to its credit with the State Treasurer $3,500.00. The vouchers covering the expenses are in the hands of Secretary Brown. Nineteen prosecutions for violation of the Pharmacy law were commenced with the following results, viz.: 12 convictions, in which defendants were fined; one case withdrawn; two failures to convict; four still pending. The cases were scattered through 10 counties, and were prosecuted at an expense of $720.16.

MR. JESSON: In connection with the report, I desire to say a few words in regard to prosecutions. We have employed an attorney. One difficulty we have encountered is that when a case is brought before a local Justice of the Peace, and the offender is convicted he will impose a minimum fine, which is ten dollars. That is a very small fine, but it is the best we are able to secure. In one case here in Detroit we did secure a judgment of $15. Another difficulty we encounter is that in a number of cases the Prosecuting Attorney has refused to act. In such cases as that we are at sea; we don't know what to do. We can have a mandamus issued from the Supreme Court compelling him to act; but if you force an unwilling Prosecuting Attorney into a case he is very apt to drop it.

Some complaint has been made to traveling men that complaints made to the Board were not attended to as they ought to be. In relation to that I would say, that a great many complaints are sent to the Board without any signature attached to them, and such complaints cannot be en-

tertained. We want some reliable information. For that reason we demand that anyone making a complaint shall sign his name, when it shall be investigated. We send our attorney to a town to look up a case, and we want him to go to some place, if necessary, to get points; but the man who makes the complaint need not enter into the case at all; but to show that he is acting in good faith we require the complaint to be signed in every case.

On motion, the report of the Secretary of the State Board of Pharmacy, was accepted.

MR. WELLS: There is one thing in the report of the Secretary of the Board of Pharmacy that I would like to inquire about, and that is with regard to the refusal of Prosecuting Attorneys to prosecute cases when complaints are made. I would like to ask on what grounds they decline to make prosecutions.

MR. JESSON: There are a number of ways out of it. For instance, they will claim that there is not sufficient evidence to convict. In some cases we have to give security for costs. There is a case over here in Sandusky, Sanilac county, that has been before the Board for some time, and the Prosecuting Attorney promised to issue a warrant for the arrest of the party. I think that was on the 30th of April last, and we have not been able to get him to do it. He is undoubtedly a friend of this druggist, and may, perhaps, think the druggist has some political influence.

MR. WELLS: It seems to me in any case of that kind the Attorney should be reported to the Governor, which would be sufficient to make him act.

A MEMBER: Mr. Day, a member of the Illinois delegation, is present, and I think we would like to hear from him.

MR. DAY: *Mr. President, and Gentlemen of the Pharmaceutical Association:* As a member of the Board of Phar-

macy I am interested in the enforcement of pharmacy laws, and as a natural consequence, in proportion as the Boards of Pharmacy do good service I am inclined to place them in front or to the rear of the column. It seems to me that the Michigan Board of Pharmacy has served the Association which created it in a very acceptable manner, if we may judge from the reports they give, not only in the prints, but through their Licentiates, who come to our State. Placing your Board, therefore, at the head of the list as I have, I felt very proud when I found I had been selected to come to this Association as a delegate. In Illinois we think we have an Association of which we may be proud, and we have done some work that entitles us to be placed along with yourselves. I should be glad to furnish you any information in my possession bearing upon the question you are discussing, but I don't exactly know what part of the subject you want me to talk to. Therefore if you will lead me out by questions I will be glad to answer them. I understand your Prosecuting Attorneys will not act? Is that it?

PRESIDENT: That is the point the Secretary makes.

MR. DAY: We found that trouble in our State, and we don't think it is a good thing to say they won't act, because they say they will act. But we find they are too busy, or there is some other reason why they fail to act. There is one trouble in our State, that the fee they get for prosecutions amounts to little or nothing and that may be one reason why they don't want to act. Another reason, unquestionably, is that they are at home while the prosecutor is from another county. I found that when I went to a town away from Springfield to prosecute a case of violation that I was looked upon with suspicion. Frequently I would find on the juries men who were laboring men, perhaps, who worked for a small amount per day and the other attorney would appeal to their prejudice and say,

"this man makes probably as much as two or three dollars a day, and our laboring men work for a dollar." Then, too, the Prosecuting Attorney depends upon the people for his retention in office and that has its influence upon him. We have one attorney and as I understand from your Secretary's remarks, you have one also. But our attorney does not go to the Prosecuting Attorney of the county and ask for a warrant to issue from him. Whether our plan would work in your State I don't know, but in Illinois our attorney goes to a town where a violation has been committed and brings a suit, and we invite the Prosecuting Attorney in a courteous way to take part, and if he does it is all right, and if not we try the case and if we lose in the lower courts we appeal to the upper courts. So successful have we been that we have very little trouble any more in that line. The evidence is accumulated and the defendant is informed about what we expect to do, and he is given his choice to either make a confession and plead guilty or not. If he pleads guilty we agree upon such an amount of fine as may be satisfactory to both parties, and the case goes no farther; he pays his fine.

MR. EBERBACH: How do you yet your evidence?

MR. DAY: In two ways. Of course the complaint comes in the first place from a neighboring druggist as a rule, and I write to him assuring him his name will not under any circumstances be disclosed, that I simply want to get possession of the information that he has, which he gives readily upon the assurance that I will not use his name. We then send our attorney to the town and he gets what additional facts he can by talking to the complainant and other people and we have no trouble in getting the necessary information in that way. I understand from your Secretary's remarks that you turn the money you receive into the State Treasury, but we use our money our-

selves and dispose of it as we see proper within the law of course. We prosecute in Illinois at a profit.

MR. PARKILL: Do you say your prosecutions are made at a profit?

MR. DAY: Yes sir, our prosecutions don't cost us as much as we receive. One half of the fine goes to the board and one half to the school board of the town in which it is carried on. We prosecuted for the term ending the 31st of December about 80 cases, 70 anyway, and were successful I think in 74 or 75. Since the 1st of last January we have prosecuted 60 cases.

MR. PARKILL: What is the average amount of fines?

MR. DAY: $50.

MR. PARKILL: Do you have second convictions?

MR. DAY: Yes.

MR. PARKILL: In that case does the fine increase?

MR. DAY: Yes. Our penalty is $50 for every such offense. The Justices of the Peace have held with us that a sale proven is an offence, so that each sale we prove costs the defendant $50. I find upon conference with members of different boards throughout the country that we might arrange with each other for mutual aid in these respects. We have some points in our law that we do not work out as nicely as we might, and it seems to me that interchange of ideas would be of mutual benefit. I hope the time will come when we shall be more closely cemented together as boards of pharmacy.

PRESIDENT: Has the committee on Legislation any report to make?

MR. WELLS: The committee has no report to make.

PRESIDENT: We will now take up the report of the committee on Trade Interests. The chairman of the committee will now proceed with his report.

MR. WURZBURG: The second section relates to the custom of many physicians furnishing their own medicines, such medicines being frequently purchased from the jobber or wholesaler. We have always had that same trouble to contend with. The physicians as a rule who send the least number of prescriptions want to buy their own medicines and deal them out. They want to buy them at a very low figure, 25% off on extracts and 70 and 10 off on bottles. I would like to hear from the Association on that subject.

MR. WELLS: I move that the physicians be instructed not to do so.

PRESIDENT: We will pass to the next section.

MR. WURZBURG: The next section relates to the forcing upon the retailer by agents of samples of articles used by the retailer.

MR. GUNDRUM: I think we all experience more or less difficulty of this kind. Some one comes in who has some new thing and for safety I always think that about a quarter of a dozen will fill the bill.

PRESIDENT: Don't you sometimes have some of that left?

MR. GUNDRUM: Yes.

MR. WURZBURG: The next is a suggestion as to the true plan for the sale of proprietary medicines.

MR. JESSON: What do you mean by that?

MR. WURZBURG: It refers to the rebate plan.

MR. WELLS: So far as my experience goes this rebate plan has had the effect of advancing prices on nearly all patent medicines, I think there is no question about that, unless pharmacists by knowledge and acquaintance with each other can take advantage of the rebate plan, which they can do with a portion of the patents they sell.

With a large portion, however, I think they can not. A plan was adopted and reported to the National Wholesale Druggist's Association at one time when I had the honor of attending a meeting of that Association as delegate from the State Association. It was reported that some druggists up in Maine I think, or one of the New England states, had combined and were buying patent medicines—absolutely buying them on the rebate plan and dividing the profits among themselves. The information was received by the wholesale druggists with the greatest indignation. The retail druggists were informed they had no right to do that, they were usurping the profits of the wholesale druggists, and I have never heard of any retail druggists doing it since. I think they were frightened.

At the same time, in Michigan, I have sometimes thought that it might be a good plan, (where we have more courage than they have in New England,) for the retailers to combine and buy in large quantities and get the benefit of the rebates. I don't know but they do that in some localities. I would like to know if anybody present does?

MR. WURZBURG: If they are found doing it once they can't do it again.

MR. EBERBACH: We had quite an elaborate discussion upon this subject the other night in the joint meeting. It was the same discussion and with the same results that we have had here frequently. It occurred to me in listening to those remarks that there was considerable inconsistency in it. The retail druggists complain of the jobbers retailing. At the same time, they assume that they should have all the advantages that the jobber has. They want to buy from jobbers such things as are to their advantage and they want to join together and buy a little cheaper and divide the spoils. Now, there is something wrong there in principle. If we wish as retailers to enjoy

the privileges of wholesalers' rates we must concede to them the privilege of retailing. If we wish the privilege of uniting together and buying in large quantities and dividing the spoils we must give them a chance to make themselves whole by selling at retail. I may be wrong, I have had no experience in it. As far as the purchase of articles and combining together is concerned, I think the wholesalers have made ample arrangements to meet that. At least we have had presented to us quite a number of circulars with the request that we should sign them before we could get a large quantity, and that circular provides distinctly that we are not to divide with our neighbors. Of course a circular of that kind I don't think has any business principle at the base of it, because if I buy a lot of goods it is no business of another person how I dispose of them.

I think the interests of the proprietary men is with the wholesalers as distributors for the retailers and that they ought to protect them in such a way as is proper and that they are entitled to some profit.

MR. WELLS: Mr. President, I heard this same argument the other night and there is one part of it that I think is not historically true, and that is that the cutting ceased in this State when retailing begun. Cutting ceased in this State at the time the Campion plan was adopted.

MR. GUNDRUM: Cutting between whom?

MR. WELLS: The retailers.

MR. GUNDRUM: I referred to the cutting of the jobbers.

Mr. WELLS: What the retailer has to fear is the cutting of the retail prices of patent medicines. The Campion plan stopped that in this State. After the Campion plan was adopted the rebate plan was introduced between the jobbers to help themselves, because they said the cut-

ting among themselves was so great that they did not make over two per cent. But I do not see where we are interested in that. We are interested in buying these goods as cheap as we can, and the wholesaler is interested in making all he can. I have not been engaged in the business, and I have no confessions to make. At the same time, if any of my friends have engaged in it, I am perfectly willing on the spot to give them absolution.

MR. EBERBACH: I do not wish to leave the impression that retailers should not buy as cheap as they can, but I do not think we are justified in complaining when we have this same thing coming up every year, that jobbers are retailing. Let them retail. We are on the same footing.

MR. GUNDRUM: I can see no reason why the wholesaler is injured if we have to buy proportionately large. I don't think there is a great deal of it bought directly in large quantities; but even the wholesalers established the precedent by saying "If you buy so and so you get 5% off." Suppose I get acquainted with my neighbor by coming to this meeting. I have confidence in him; I think he is a man of honor, and I say to him, let us buy $200 worth, and instead of getting 5%, get 7½%. I don't see why we are committing any special offence by buying a hundred dollars additional, and I think so far there has been little bought directly from manufacturers. I don't know of but one case.

MR. MCDONALD: I believe every dealer has a perfect right to buy goods as cheap as he can, I have no objections at all to the rebate plan, except that the prices are not properly graduated. That is to say, a druggist can order one sixth of a dozen and get it at the same rate that another dealer pays for two dozen. In other words, he cannot get any reduction in the price of the article unless he buys half a gross or a gross. That is the only objection I

have to the rebate plan. I would like to have the scale differently graduated.

MR. WURZBURG: There is only one article that I know of that is graduated as to small quantities, and that is Sanford's Liver Invigorator. If you buy a dozen you pay a certain price and for three dozen another price.

MR. GUNDRUM: I call to mind another case, Hood's Sarsaparilla. Last spring I thought I might as well buy a case of three dozen. It came charged at the regular dozen price. I had not stopped to inquire the price. Well, this year I thought I might just as well take a gross and then I would get 5%, and I added the other to it and I got 5%.

PRESIDENT: I don't wish to take any part in the discussions that come before this meeting, but inasmuch as this question was practically discussed last evening, I would like to define my position on it at this time. There is a great deal of justice in Mr. Eberbach's remarks in regard to the wholesaler, and personally I believe that the rebate plan, if it can be somewhat modified, is as near to a solution of the difficulties that we meet in cutting prices as anything we can find. I think that the correct principle of selling goods is a quantity price, therefore, if a man buys one bottle of an article he ought not to buy it as cheaply as he buys a dozen, and if he buys a dozen, to carry out Mr. Donald's idea, he should not buy as cheaply as he does three dozen, and so on.

The difficulty I find with the rebate plan as it exists at present, is that the wholesaler attempts to follow his goods after he sells them; in other words, seeks to make us sign a contract by which he holds us to an agreement that after we buy his goods we will sell them to suit him. I do not think that is right. I think after a man buys his goods and pays for them he has the right to do with them as he sees fit. At the same time, I think they have justice on their side in the rebate plan if they would take off that re-

striction and grade their amounts smaller, and I think that would meet one of the objections made. Now then, they complain against us as they have, about selling in quantity, and for our part we complain against the wholesalers for retailing. I tell you gentlemen that a man who has goods to sell is going to sell them every time he gets a chance.

Wholesalers in this State claim they do not retail, and in a great many cases they do not. And why? Because they think it brings more dollars to them not to retail.

The only thing I have advocated in all my talks with wholesalers, is this, "when you sell a dollar bottle of medicine, get a dollar for it. When you sell a dozen get a dozen price, when you sell three dozen, get a three dozen price, when you sell a gross, get a gross price, and the retailers will meet you on that ground."

MR. WELLS: We do not complain of their retailing, what we do complain about is their retailing at wholesale prices.

MR. WURZBURG: The only objection I have to the rebate plan is, as was stated by Mr. Bassett, that they do not grade the quantity; that they make the quantities too large and do not make enough intermediate quantities. If you take a person who is doing business, like Mr. Peck for instance, or myself, doing a small amount of jobbing, every person gets a price list of $1.75 a dozen, while we perhaps have to buy in three or five gross lots. The small dealer comes in and we have to deal out the article at $1.75, and what do we make? About four cents on the transaction. I think where there is less than an entire package ordered we ought to get a corresponding advance in price.

MR. BROWN: We all know that jobbers formerly sold these proprietary articles at a very close margin, and if you stop to think for a moment you must know they can-

not afford to handle goods for any such margin, and consequently they have to make their profit on other goods about which we are not so well posted. I am satisfied that since the rebate plan went into effect that we are not paying any more for goods, but rather are buying at a less price.

MR. WURZBURG: I don't think we are paying any more for goods. We are paying eight dollars a dozen for Hostetter's Bitters while formerly they sold—I have bought them as low as $8.05 and I know they cost the jobber $8.00. The most staple patent medicines are sold to-day to us just as cheap as they were before the contract plan went into effect.

MR. BROWN: That has been my experience.

MR. WURZBURG: While you find some advanced others have been lowered.

MR. WELLS: There is a long list of them I think that have been advanced.

MR. EBERBACH: We have another parallel here in our own experience that shows our position very well. We complain that the doctor goes to the manufacturer and buys his goods at wholesale prices at which we cannot afford to furnish them, at the same time, we take the doctor's position and don't want the wholesaler to have his share out of it. In the one instance we feel aggrieved, in the other instance we are the aggressors.

MR. WELLS: That has nothing to do with the matter of price.

MR. EBERBACH: It has something to do with the principle of the matter.

PRESIDENT: The object is to formulate some way by which we can all be protected. We will now pass to the next topic.

MR. WURZBURG: The next is as to the discouragement by the trade of such patent medicines as are liable to inflict injury upon the public. As was mentioned in the President's address, such articles as Buckland's Essence of Scotch Oats.

MR. JESSON: That is another subject as old as the Association, and the only way out of the difficulty is through the suggestion that the manufacturers be compelled to furnish the formula or have it printed upon the label. That gives us something to work from, and if it is injurious we can refuse to sell it or procure proper legislation upon the subject, but I do not see any other way to regulate it.

MR. CALDWELL: I think a person that sells such a remedy as Scotch Oats—and we all know something about it—ought to inform his customers what he knows of it. By reason of their advertisements we are compelled to keep it. I have frequently told them it was supposed to contain morphine. I didn't tell them it did, but I told them it was supposed to, and some have refused to take it.

MR. PARKILL: From a moral point of view that was the proper thing to do; from business standpoint it was not. I remember once of telling a woman that Kidney Wort was composed largely of a certain article and she left without taking it, but she afterward went to another store and bought the same thing.

MR. WELLS: Winslow's Soothing Syrup a few years ago had a large sale. That contains morphine, but nobody objected to it. I don't know that we ought to select one single article and set the seal of our disapporbiation upon it.

MR. HALL: This Essence of Scotch Oats in the original package, as put out, was claimed to do just the oppoite from what it did do. It was claimed to be a cure for

the opium habit, and at the same time contained a preparation of opium.

MR. JESSON: I noticed a few days ago in one of the journals that an examination had been made of Madame Ayer's preparation, and it was ascertained that it was nothing more or less than port wine, and it was warranted to cure the liquor habit, morphine habit, and all things of that kind, and I think it is as villainous in its effects as Scotch Oats Essence.

PRESIDENT: We will listen to the further reading of the report.

MR. WURZBURG: The next suggestion is with reference to the discouragement of the practice of some manufacturers of printing the retail price upon the label.

MR. GUNDRUM: I would suggest that if a man kept enough on hand to warrant it that he should scrape the label off.

MR. WURZBURG: I differ with you there. The Grand Rapids Pharmaceutical Association requested the New York Pharmacal Company to either raise the price to $1.50 or leave off the price entirely, and I think if they were requested to do so by the State Association it would have some effect.

PRESIDENT: Did they answer your letter?

MR. PECK: They declined to make any reduction except in $50 lots, and that shuts out the small pharmacist. He can't buy $50 worth, and cannot run the risk of the goods being unsalable. If he does fortunately sell them he must retail them at $1.25, leaving no profit at all to speak of when he considers the risk of loss on the balance of his stock.

MR. EBERBACH: I don't think there is any objection to having this price on the bottle, and it is a very conven-

ient thing provided they put up the price so there is a reasonable margin, say to $1.50. I think if the company was properly approached with such a proposition from this Association and the National Association, they would change it, or bring their wholesale price down in the same ratio.

MR. GUNDRUM: I will move that the New York Pharmacal Company be requested to leave the price off the labels on their packages.*

Carried.

MR. WURZBURG: The next suggestion is as to the organization of local societies. Mr. Peck and myself, who have worked together on this committee, having known the benefits of local organizations, are very heartily in favor of the suggestion of forming local organizations throughout the state, and as we have said here, the objects to be obtained by the formation of local societies are many. And first is the adoption of a uniform list price for proprietary and other goods. And it would seem that the successful solving of this most vexatious question would be a reason for the creation of the societies throughout the state. The local society in Grand Rapids has been organized about four years. We adopted a price list there and we get full prices for proprietary medicines and have had only two complaints under it. Those complaints were thoroughly investigated and they were found to be without a foundation. From what I know to be going on in small localities it would seem to me to be an object for them to organize.

MR. MCDONALD: I will say that in Kalamazoo we have an association of that kind. The meetings have never been by any means regular, nor has the attendance been very large, but one result of that association has been that

* I wrote to the New York Pharmacal Co. about this matter and they replied that they had discontinued the practice of putting the retail prices on ther packages.—Sec'y.

the worst cur in the country has put up his prices to regular rates. The man was a terror to everybody for ten miles around.

MR. WURZBURG: If you would keep up your organization you certainly would be well repaid.

PRESIDENT: We will pass on to the next point.

MR. WURZBURG: The next is the suggestion with reference to Sunday closing, and I would say that is another thing we have adopted in Grand Rapids. The matter was discussed somewhat at Petoskey last year, and after the meeting we adopted a method of closing our stores from one o'clock until six Sunday afternoons.

PRESIDENT: Are there any remarks on this subject of closing stores on Sunday afternoons?

MR. WELLS: I keep mine closed all day.

PRESIDENT.: It is only the wealthy who can afford that, Mr. Wells.

MR. BROWN: Do all the stores in your city close?

MR. WELLS: No, sir, I think not.

MR. GUNDRUM: I keep mine closed, except for an hour after church.

MR. JESSON: I am in favor of Sunday closing. If stores could be closed Saturday night and not open until Monday morning it would suit me, but we are not all as well situated as they are in Grand Rapids. A short time ago an effort was made in Muskegon by the Drug Clerk's Association to get the proprietors to agree to close, as they do in Grand Rapids, from one to six. They went around and received the signatures of all but four, and those four positively refused to sign. They were four of the principal stores, and consequently the matter was dropped. You may have some trouble in other towns and I think in small towns up to four or five or six thousand it is the

habit to keep closed all day, but in large towns they won't do it.

MR. WURZBURG: I will say that we did not succeed in getting all the druggists to agree to close. I think there was one at first who positively declined to close, but he was away off to one side and we didn't care about that. A few of the others kept their stores open a short time, but it soon became so universally known that the stores were closed from one o'clock that the others don't do enough business to warrant them in keeping open. The result has been that since then they have closed up their stores, at least a majority of them have agreed to.

MR. PECK: It was apprehended that the physicians would object to closing the drug stores Sunday afternoons, and when it was first inaugurated they did object, but we called upon the leading physicians and they acquiesced in the arrangement and it now all works harmoniously enough. In fact, I don't know that we have had a word from the physicians, and many of the leading physicians in Grand Rapids have their office hours from 9 to 10 or 11 to 12, and no office hours in the afternoon. By comparison of receipts of the different druggists we find that they are fully equal to what they were before. The volume of business is fully as great, only it is done in a shorter space of time. This allows us to be free on Sunday afternoon to enjoy the sunshine and dispose of our time as we see fit, instead of being obliged to spend it in the store.

MR. HOGEBOOM: Ever since we have been in business we have closed our store during certain hours on Sunday, and we find that our trade is as good, and that a great many of our customers respect us more for doing it. Occasionally our regular customers come to us Sunday afternoons to have prescriptions prepared. Ours is the only store in town that is closed.

MR. WURZBURG: The next suggestion is as to what extent the registration of sales of liquors is necessary.

MR. GUNDRUM: I know of but one case, and that was left to the executive committee last year to look after. We had but one complaint during the year. A druggist in Ionia complained of another druggist for selling liquor to minors without an order, and I thought I had a perfect right to make it my business to inquire into it. When I went to the druggist and questioned him about it he was astonished. He said he supposed that everybody was selling without any order to minors. He seemed to think that he did not even require any registration. He acknowledged his guilt.

MR. BROWN: How much did you fine him?

MR. GUNDRUM: The case has not been taken up yet.

MR. WURZBURG: That finishes the report of the committee.

MR. PARKILL: We have present with us a member of the New York Pnarmaceutical Association, a gentleman whom we all know by reputation, and I am sure the members of the Michigan Association would be glad to hear from him, Dr. Eccles.

Dr. Eccles having been called to the platform, spoke as follows:

Mr. President and gentlemen: I thought I could keep quiet back there until you got through, and then come forward. I have been listening to the queries that have been advanced, and the answers which have been given with considerable interest, and some of the points were suggestive to me of what we were doing in our own State. The question of closing Sunday afternoons has never been taken up by us, but quite a number of druggists in the outer part of the State, and some in the cities of New York, Brooklyn and Buffalo are to-day closing voluntarily without any

efforts or concerted action among themselves. I think that the proper way to control the liquor business, is by the moral sentiment of the pharmacist being raised to the proper standard, and I do not think it can be controlled very well in any other way.

In our State we have made an effort to establish local organizations at every place we can. We have men go out to the counties where they have no organization, and bring two or three of the druggists together to talk up the matter of organization, and establish a nucleus in that way. If you get three or four of the most active druggists interested in each county they will build up a county organization. We have three pharmacy boards in the State of New York, and until within a few months back they would not exchange registration certificates, so if a man went out of one town into another, his certificate of registration was of no use, he must go and register again. Then there is a general State law which provides that if I should attempt to start a drug store in any other place except Brooklyn, I could not do so without being examined, just as though I never had a store in the State at all. The State Association has quite a number of active men, and it has produced some quite good papers. The committee on adulterations has steadily watched the manufacturers and wholesale dealers in the goods they have been sending out. Whenever anything in the shape of an adulterant is found in medicine, they report it to the State Association. I notice quite a number of other Associations have followed in the wake of our Association in this respect. The proposal was made a year ago in our Association that the committees on adulteration in the different States should unite in an effort to suppress adulteration. By concert of action an advantage would be gained by druggists at large. Last year two articles were found to be adulterated: hypophosphate of sodium and bromide of sodium were badly adul-

terated in our State. The articles were found in quite a number of stores, both in Brooklyn and New York City. As soon as it was reported to the dealers themselves they stopped sending them out in New York and Brooklyn, but I am well satisfied that they did not destroy them. They were evidently sent to some other States, and if the committees on adulteration in those other States had been warned in advance to look out for them the dealers could not have palmed off the articles in those States. I have noticed lately there have been reported different cases of poisoning in the United States from the taking of compound licorice powder. Someone had unfortunately got it mixed with belladona, and if the committees in each of the States were to watch powdered senna as it comes into the State, they could guard against danger to human life. I would like to have co-operation between the different States with regard to efforts of every kind in which we are interested.

MR. BUGABEE: I would like to ask the doctor if he has any objection to mentioning the brand of the articles he referred to as adulterated.

DR. ECCLES: I have, for the reason that I am not now supplied with an unopened package, and if I should mention names without having an unopened package of the same in stock I would be very likely to get myself into a legal box.

PROF. PRESCOTT: If the Association pleases, I will read the list of queries for next year.* You will observe that there are a good many of these that call for some little work in defining the requirements of strength and purity, and completing the descriptions of the pharmacopœal arti-

* For list of queries, see page next before Constitution andt by-laws. Any member who will accept a query will please repor to Dr. Prescott as soon as possible.

cles. We have one more meeting of the American and State Associations before the committee on the revision of the Pharmacopœia will meet in Washington to make definite arrangements for that revision. I am sometimes impressed with this consideration, that we know that all over the country there are men who are well able to criticise the Pharmacopœia and point out its faults. It has become fashionable to say that the Pharmacopœia is wrong in this, and wrong in that, and wrong in the other thing. It requires work to correct the errors complained of. What I have said will apply, also, to the Preparations of the Pharmacopoeia.

MR. JESSON: With reference to query 19: I should much prefer to have that matter carried over, as I have not got far enough with the question to report as yet. I have not got a compound syrup of squills that is satisfactory to me. We use a great deal of it, and have made it up a great many times during the past year in small quantities in order to get a preparation that would be satisfactory. If any gentlemen has any suggestion to make with regard to this syrup I should be glad to hear from him during the year.

PRESIDENT: Mr. Jesson will be allowed to report at the next meeting. The Association then adjourned until 9 o'clock Thursday morning.

FIFTH SESSION.

THURSDAY, SEPTEMBER 6TH, 1888, 9 A. M.

PRESIDENT: We will take up the questions from the question box. The secretary will read the questions.

SECRETARY: The first question is, "Does the Michigan Pharmacy law prohibit others than regular pharmacists from selling Paris green?"

MR. JESSON: No, the law especially allows it to be done.

SECRETARY: The second question is, "What is the best method of mixing glycerine and tannate of quinine so as to make a clear mixture that will not gum or precepitate?"

MR. JESSON: I don't think you can make a clear solution of it. Tannin and quinine make an insoluble compound.

SECRETARY: The next question is, "What makes the best coloring for essence of lemon?"

MR. HALL: I think if the U. S. P. method is taken it is perfectly satisfactory, using just the lemon peel. If you can exceed the directions a little in the time for macerating, it makes a good rich color.

SECRETARY: Have you ever had a bitter taste develop in the essence by leaving the peel in long?

MR. HALL: No, sir.

PRESIDENT: It will do it sometimes. There is a difference in the rinds of lemons in that respect.

MR. HALL: As a usual thing I have not left them in to exceed 72 hours.

MR. JESOSN: Add a few drops of the the tincture of curcuma.

SECRETARY: "Should there be any change in the formula for spirits of camphor, U. S. P.?"

MR. JESSON: I think that should be changed back to the formula of 1870.

MR. HALL: After the 1880 U. S. P. was issued I tried spirits of camphor according to that method, but I very soon stopped it and kept the 1870 method. I stopped it because it was very unsatisfactory.

SECRETARY: The next question is, "Can some method

be suggested by which syrup of Rhei U. S. P. can be prevented from moulding without injuring it medicinally?" I put it in half pint bottles, securely corked and sealed and I have no trouble with it.

MR. JESSON: The aromatic syrup will keep well.

PRESIDENT: Miscellaneous business is now in order. Is the committee on insurance ready to report?

MR. BROWN: Yes. The committee will make a verbal report. In looking up the matter we learned that the Wholesale Druggists Association had formed an insurance company and had so arranged it that they are now prepared to accept risks from retail druggists. And we would recommend to druggists not satisfied with their insurance rates to investigate the advantages of this wholesale druggists insurance company. Mr. Hinchman explained yesterday quite in detail the workings of that company, and I presume the most of you heard him. If any member desires any information on the subject I will endeavor to give it.

SECRETARY: In discussing this subject with one of the wholesale men of this city, he expressed the opinion that if the company began taking small risks it would not be long before the advantages of the company would amount to nothing; that their saving in expense arose from the fact that they took large risks only. If they take a large number of small risks they will have to employ inspectors and perhaps have local agents, and that would result in bringing their expenses up to the point of the old line companies.

MR. HALL: In the letter I received from Philadelphia, was inclosed a list of blank questions to be filled out, giving the customary information as to size of building, and other details. What provisions there were to prevent or extinguish fire, etc. There was nothing mentioned about

an inspector. They enclosed that list of questions to be filled out with the application to be considered at the main office.

The association then proceeded to the nomination and election of delegates and alternates to the meeting of the American Pharmaceutical Association with the following result: Delegates—F. M. Alsdorf, Jacob Jesson, Geo. McDonald, F. J. Wurzburg, S. E. Parkhill. Alternates—Frank Wells, Wm. Dupont, A. H. Webber, C. E. Kellogg, G. W. Stringer.

PRESIDENT: We will now listen to the report of the executive committee.

REPORT OF EXECUTIVE COMMITTEE.

To the President, Officers, and Members of the Michigan Pharmaceutical Association.—Since our meeting last year at Petoskey your Committee has held but one meeting viz: at Detroit, June 29th, to make arrangements for this meeting. Mr. Jas. Vernor, our Local Secretary, had made out a programme which was changed but little, so arranged that the two Associations interfered with one another as little as possible in their meetings. Three members, Mr. Inglis, Mr. Wells, and Mr. Gundrum, and Secretary Parkill, and Local Secretary Vernor, and the full Board of Pharmacy, and Mr. Dupont our Treasurer, and some others were present. The programme as you see it was arranged:

Mr. Vernor was authorized to rent Light Guard Armory, and employ our short-hand reporter, Mr. Whitaker.

As the exhibit building was wholly in charge of the A. P. A., we do not have any expense from exhibit this year.

The books and accounts of the Secretary and Treasurer have been examined and found correct.

The bonds of the Secretary and Treasurer were fixed and given at $1,000 each and approved.

At our last year's meeting the investigation and possible prosecution of violations of the liquor law, was turned over to your Committee with power to act, but happily no cases were reported for our action; happily because, if cases had arisen we should have had no money on hand wherewith to meet expenses.

When the last bill, the bill for the printing of the Proceedings

$456.20 came in we did not have funds enough on hand and our Secretary was obliged to ask for dues and collect some on unpaid advertisements to meet this bill. Your Committee would recommend that the annual dues be raised, or that the members be careful in voting out the money of the treasury. The expenses of the printing of the Proceedings have been considerably increased on account of the less advertising matter.

Your Committee is impressed with the importance of having a sufficient sum in the hands of the Treasurer to meet necessary expenses that may come up during the present year.

The standing of the Association is gratifying. If we are not the strongest we are at least among the best in the United States.

GEO. GUNDRUM,
FRANK INGLIS,
A. H. LYMAN,
JOHN E. PECK.
Executive Committee.

On motion the report was accepted and placed on file.

MR. GUNDRUM: The absent member of the committee sent in a letter this morning and a bill for his attendance here in June. I would like to have the secretary read it.

The Secretary then read the letter from Mr. E. T. Webb and the bill enclosed.

MR. GUNDRUM: I preferred that the bills of the executive committee should come before the Association and for that reason I abstained from auditing their accounts.

The bills having been read, on motion of Mr. Alsdorf they were audited and allowed.

MR. JESSON: We have with us an old time friend of the Association, Mr. Eliel, of South Bend, Indiana, who has always taken a lively interest in the success of this Association and I think we would be glad to hear from him.

Mr. Eliel having been called upon by the President responded briefly, congratulating the Association upon the success it has attained.

PRESIDENT: The next order of business will be the report of the committee on the President's address.

Mr. Wells, as chairman of the committee, then read the following report:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Mr. President and Members of the M. S. P. A.:—We congratulate you on the fact that the annual address of Pres. Bassett adds still another to the valuable papers which enrich the literature of this Association. It recounts the events of the past year in which we are specially interested; exhibits some of the evils from which our profession suffers and breathes the same spirit of loyalty to our organization which Pres. Bassett has shown throughout the period of his official life by his zeal and activity in doing all in his power to promote the interests of our Association. The recommendations contained in the address are timely and should receive our careful consideration.

We commend the recommendation that the Association continue to stimulate the formation of local associations and also the suggestion, that in the absence of such local organizations, one or two social meetings of pharmacists may "do much towards bringing pharmacists into agreeable relations with each other."

We are in full sympathy with the expressions concerning the loss the Association and all it is interested in have sustained in the departure of Dr. Lyon for other fields, and earnestly join in the hope so well stated that he may "soon see the error of his ways and return to us."

We deem it unnecessary to comment on what the President says of our Local Secretary, Mr. James Vernor, as the admirable arrangement of every thing connected with this meeting, so largely the result of his genius, tells more eloquently than words, of the labors he has performed.

We are in full accord with the thankful emotions of the President that the past year was not one for the meeting of the legislature, and that we have therefore escaped the consequent annoyance of being compelled to resist the passage, by that body, of any new and unjust laws, affecting our interests. We advise the adoption of the President's suggestion that we endeavor to send to the legislature "men who understand the needs and requirements of our business," as the few who were members of the last legislature aided materially in preventing the infliction of the great wrong that

body attempted to inflict upon us by classing us with saloons and subjecting us to the saloon-keepers tax.

We endorse all the President so well says concerning the association of pharmacy and quackery. It is surely a stigma upon our profession that we apparently sanction the purchase and use of articles the character of which may be so well understood by the descriptive label of one read by the President. If this evil can be remedied in the manner recommended by the President, the compelling of proprietors, by some legal enactment, to attach to the label of each package of their preparations a correct formula of its contents, it would certainly result in great gain to the reputation of pharmacy, and in still greater gain to the health and pockets of a long suffering but ignorant people who are daily made victims of by the unscrupulous pretenders who mercilessly prey upon the hopes of the weak and the afflicted for gain.

We have had so little time to investigate the practicability of the plan proposed and its importance is so great that we recommend, in order that it may be properly considered, that a special committee be appointed to give the subject the attention it should properly have and report at our next annual meeting.

Though we can see the importance of having every registered pharmacist a member of this Association and contributing to its support, yet we cannot advise that an attempt be made to render this compulsory by securing an amendment to the pharmacy law to accomplish that object at the present time. This would be the only means to bring this about and we think the dangers incident to the necessary changes in the pharmacy law would outweigh the benefits which would follow.

The evils which result from the adulteration of medicines and food we believe to be as stated in the address "monstrous" and that, as recommended therein, we should make strenuous efforts to correct them. We commend the matter to the committee of the Association on this subject with the hope that through their effort our Association may be able to do effective work towards checking some of the deplorable results which follow from the admixture of foreign and unknown substances to these two important elements of existence, medicine and food.

We heartily endorse the recommendation that "each member appoint himself a committee of one and secure a new member during the coming year. We also approve the recommendation that whenever the failure of a pharmacist to register becomes known to

any member of the Association, the Board of Pharmacy shall be immediately notified of the fact by such individual.

FRANK WELLS,
F. J. WURZBURG,
F. N. LATIMER.

MR. JESSON: I move that the report be accepted and discussed section by section.

Carried.

MR. WELLS: The first recommendation is that local associations be stimulated, and a further suggestion that in the absence of such local associations one or two social meetings of the pharmacists may do much towards bringing them into social relations with each other.

MR. PARKILL: I move the adoption of that section of the report unless there is some discussion upon it.

MR. BASSETT: It seems hardly right for us to sit here and not say something on this question after the compliment that was paid Detroit in the meeting the other night by our friend from New York, who said that Detroit had by organization secured more than they could secure in the East without organization, although they had tried it. During the last year I have written a great number of letters, besides appointing parties to organize these Associations. I certainly hope that the matter will be kept moving and that the new President will act in the same line.

MR. WELLS: The next section relates to the departure of Dr. Lyon.

MR. PARKILL: I offer the following resolutions:

Resolved: That in the removal of Dr. A. B. Lyon to engage in his new field of labor in the Sandwich Islands, this Association meets with the loss of an earnest worker, a devoted friend, and one of its most loved and honored members.

Resolved: That the Association in convention assembled sends greeting to Dr. Lyon and expresses the hope that though deprived of his presence at our meetings, we may still be favored with his

valuable contributions to the Pharmaceutical Literature of the United States.

Resolved: That a copy of these resolutions be forwarded to Dr. Lyon.

The resolutions were received with applause, and were adopted unanimously.

MR. WELLS: The next paragraph relates to the local secretary, Mr. Vernor.

MR. ALSDORF: I move the thanks of the Association be extended to Mr. Vernor by a rising vote.

Adopted unanimously.

MR. WELLS: The next paragraph is with reference to the necessity of sending men to the legislature who know about the requirements of our business.

MR. GUNDRUM: I belong to one of the political parties, but always keep on the good side of the other fellow, for fear he will get to the front.

MR. BASSETT: It has been mentioned here that we ought to thank the legislature of four years ago for what they did for us. One of the men who worked the hardest for us in the legislature was a man we sent from here. I say "we" because it is believed that he was elected by the vote of the druggists of this city. He was put there for the very purpose of putting through that pharmacy bill. Many of us voted for him who do not belong to his political party.

MR. EBERBACH: The city of Detroit has a great advantage over the other parts of the state in that respect, because it consists of a large body of people. In our district we are too much scattered to get together as pharmacists and talk the matter over and have concert of action.

MR. GUNDRUM: A candidate for office will listen to a man's just cause, and ours *is* a just one. There is no

trouble about getting *promises* because they are all after individual votes, and the members of this Association can do a great deal toward putting things in such shape that when we go there we can say to them, you said you would do so and so last fall when you needed votes, and now we want you to live up to your promise.

MR. WURZBURG: The time to do this is before election.

MR. BUGABEE: It is rather strange to me that there are so few druggists members of the legislature. I can only explain it in two ways: one is that we are so extremely modest, and the other is that we are not used to such short hours as they have in the legislature.

MR. WELLS: I think the suggestion of the President is a good one. I believe that every member should assist in trying to secure representatives to the legislature, who may, in an emergency, be able to help us. I think if we could get a sprinkling of druggists there it would be an admirable thing, for the few who were in the legislature last session helped us very much by watching the course of events and keeping us posted.

The paragraph was then adopted.

MR. WELLS: The next recommendation is that there shall be attached to each package of patent medicine, a formula, showing its contents. Your committee recommend that a special committee be appointed to give the subject consideration and report at our next annual meeting.

MR. EBERBACH: I think we ought to be very careful in this matter. We must take into consideration that parties interested in proprietary medicines have got an influence back of them greater than this Association has, and they know how to use it. I think the scheme to make patent medicine men label their goods will meet with much

opposition. In some European countries it is required. There they are subject to the same regulations and investigations that pharmacists are. Patent medicine men are compelled to file their recipe with the commission, accompanied with an affidavit that it is a true copy. The commission can at any time drop into their works and see what kind of material they are using and whether it conforms with the formula filed. If they use materials recognized by the Pharmacopoeia and conform to their formula they are protected by the government. But if they use improper material their rights are cancelled. We cannot hope to pass laws of that character here, but I think in the course of time we can so control it that these men will be obliged to put their formulas on their articles, or be compelled to file with a commission to be appointed, their formulæ, and get a permit from that commission to manufacture that kind of preparation provided they live up to it.

MR. BASSETT: In studying this question I realize that it is impossible for us as pharmacists to revolutionize this State at once, but I believe that we are associated together for some greater purpose than coming here year after year to answer questions as to how we shall make spirits of camphor, or keep syrup of rhubarb from moulding, or having a social time. These are all well enough in their places. We have, as I stated in my address, a University that stands second to none. The people of this State support that University, by taxation to the extent of about $100,000 a year, and Prof. Prescott thinks that the School of Pharmacy has four or five thousand dollars out of that. The people pay these taxes for the purpose of educating men to act as pharmacists in our own State, and after obtaining that education, should we not consider ourselves in duty bound to do something for the people? As men who desire to do what is right, we ought to take hold of the subject. We are interested morally and financially,

and we ought to insist upon it until we accomplish something.

I think there is meat in this question and it is some thing which this Association ought to commit itself to. It is a real living issue, and I hope the movement will be started and I believe in the end we will accomplish something.

I would like to have this matter put in charge of the legislative committee.

MR. WELLS: The committee in considering this question realized its importance. They realize the fact that the patent medicine trade is a very important branch of the drug business.

Now, there are two opposite influences brought to bear upon one's mind. One is the immediate profits of a large number of druggists in these medicines, and on the other side there is the character of the medicines themselves. If the recommendation of the President should be embodied in a law what results would follow? One result would be that the patent medicine men could not sell unless they printed the formula, and they would not do that. Then, they would advertise their medicines in this State just as they do now, and their victims would be induced to procure those medicines in some other way, and the profits now paid the druggists in this State would probably go outside of it. Unfortunately the general government has no power in the matter. The question has been submitted to Judge Cooley and he says that the general government could not pass a bill of the kind. Therefore, the committee thought that in view of the importance of the question involved, and in view of the various conflicting interests, it would be better to give it proper consideration and have this Association act at the next regular meeting with all the light before it it could get.

MR. BASSETT: I thing the remarks of Mr. Wells upon

this subject are correct. As far as the patent medicine men are concerned the attempt is not to prohibit, but to control. Inasmuch as we all concede that there is no prospect of carrying measures through the next session, I think the proposition to have a committee appointed to investigate this question is a proper one. In addition to that they could be instructed to open negotiations with sister Associations in the neighboring States and instead of starting in at our legislature try to get the thing started all over the United States and it will make us so much stronger. We cannot hope to pass such a law under four years, but we can make a start in the right direction.

MR. EBERBACH: In answer to the point made by Mr. Wells as to taking the money out of the State, it seems to me that point is answered somewhat by the fact that when these things are put in their true light the druggist will get back a good deal of legitimate trade that is now turned into these channels. I do not believe a very large percentage of the people will send their money out of the state, to get a proprietary article. New York State took steps of this kind and immediately the whole patent medicine fraternity "jumped" on them and tried to stamp the life out of them, and they did for the time being, but the leaven is at work and we have the right on our side.

MR. BROWN: I move that the recommendation of the committee be adopted.

MR. WURZBURG: Does that leave it so the committee will report at the next meeting?

MR. BROWN: It is so intended.

The motion was adopted and the appointment of the committee was left with the President.

MR. WELLS: The committee deemed it inadvisable to take any action on the next recommendation.

PRESIDENT: I would like to explain how the matter

looked to me. One of the greatest difficulties in keeping up an Association of this kind is to secure the payment of the yearly dues. This year we have dropped seventy of our members on account of the non-payment of the dues. The druggists of the State are all interested in an Association of this kind. It is for the benefit of all. Our Pharmacy Board has already turned over to the State treasurer $3,500, which means that it is in the hands of the State treasurer subject to their order. Could we not devise some plan by which we could have the money for registration turned over to this Association for its use in furthering its work? This would relieve the membership of the State from paying any dues beyond the registration fee. It seems to me that the money that the druggists pay into the State treasury ought to be at their command.

MR. JESSON: This question has been before the Illinois Association, and they are going to adopt something of that kind. I think it would be well before we go any further, to see how they succeed with the experiment. I don't think myself it will work. The secretary of that Association said yesterday, they have about 3800 members. That rather surprised me, but I think our membership is more real than theirs is to-day.

MR. EBERBACH: There is another point which I think would not permit such a law to be carried out. The Illinois Board of Pharmacy has a large advantage over our Board. They get one-half of the fines and we get nothing. Their fines amount to $50 and ours to $10. If this money is turned over to the Association is it ready to pay these expenses? We have got the start of our first surplus, and our income after the first large installment has been much smaller. If our prosecutions increase in the ratio they have for the last two or three months $700 will not begin to cover the bill. If we have to carry cases up we cannot risk failure for lack of funds.

PRESIDENT: It is moved and supported that we adopt the report of the committee, reporting adversely on the recommendation of the President.

The motion prevailed.

The Association then adopted the recommendation that whenever a pharmacist fails to register, and it becomes known to any member of the Association, the Board of Pharmacy shall be immediately notified.

MR. JESSON: I move the adoption of the report of the committee on the President's address, as a whole.

Carried.

MR. JESSON: Mr. President, I notice we have with us one of the oldest pharmacists in the United States, a gentleman who has been interested in pharmacy from infancy. At present he is a professor in the New York College of Pharmacy, Mr. P. W. Bedford, and I am sure we should like to hear from him.

The President then invited Prof. Bedford to address the Association.

PROF. BEDFORD: Mr. President and gentlemen, I am very glad to meet the Michigan Association. It is something I had hoped would be accomplished some day. Mr. Jesson made a remark which I must take exception to, and that is that I am one of the old druggists. I am sure none of you can see my youthful face, and accuse me of that, but I can't help telling a little joke on myself, and that is that nearly twenty years ago I called on a druggist in one of the eastern states, and when I went in and introduced myself he made the remark, "Good Lord, are you Bedford? Why, I expected to see an old man," so I don't know that I can object very much to what Mr. Jesson has said.

I have been interested in the remarks made on the pharmacy bill. I carefully watch the doings of the Boards of Pharmacy and I am very glad to know you are making

some effort to enforce your laws. Unfortunately many of the laws do not contain an enacting clause, by which you can punish those who defy the law. I am glad to say that such a thing can be done in your State. It is not so easy to do it in ours. I do not wish to trespass any further on your time. I am glad to meet the brethren in Michigan, and to know they feel an interest in the progress of pharmacy. I hope you will have a very gratifying year in your meeting and in your personal business.

SECRETARY: We have the report of the committee on exhibits, which ought to be acted upon. It is as follows:

To the Michigan State Pharmaceutical Association and Officers:

The committee to whom was referred the awarding of the prize for the most instructive exhibit, would respectfully report that McKesson & Robbins are entitled to the prize of $25.

The report of the committee was accepted and adopted.

MR. JESSON: This Association offered a prize of a medal to the member who brought in the largest number of members at this meeting. I would like to hear who is entitled to that medal.

SECRETARY: I have no reliable information in regard to that matter. I think, however, that Mr. James Vernor is entitled to it. This list Mr. Parkhill made up showing that he is entitled to it. (Laughter).

PRESIDENT: Perhaps that is the reason he has gone out.

SECRETARY: I think it would not be safe to award that to Mr. Parkill until we have an opportunity to confer with him.

MR. GUNDRUM: I move that this matter be deferred until the afternoon meeting.

PRESIDENT: It will be so considered. Is there any more business to come before this session ?

MR. JESSON: The time and place for the next meeting.

A long discussion in regard to the time and place for holding the next meeting here occurred, during which several places were mentioned, but it was finally decided that Detroit should be place, and the second week in September the time.

MR. ALSDORF: I propose that this Association next year do away with all entertainment, and I make a motion to that effect.

MR. BROWN: While I think we have had in the past *more* entertainment than is necessary, I very much question whether it would be wise to do away with *all* entertainment. All State Associations and the National Association make that a feature of their meetings, and I am satisfied that it brings many persons to the meetings who would not otherwise come. Certainly very few would bring ladies with them if it was simply a business meeting. I think it is a matter which ought to be left largely to local druggists. While we might express it as the sense of the meeting that very limited entertainment, if any, should be provided, I do not think it would be expedient to take the action that is suggested.

MR. EBERBACH: I agree with Mr. Brown. We come here certainly for business, but we also come for a little recreation. We can connect with our meetings some form of entertainment, with the understanding that the Association shall bear the expense. We do not want to meet here on business alone and rush home to business again.

MR. ALSDORF: My idea in making this motion was that the Association could hold their meetings in the day time, and in the city of Detroit there is always enough amusement of different kinds in the evening so that members could entertain themselves as well as they would care to be entertained. I know it must be a burden on the Detroit

druggists to entertain so large a number as has attended this convention, and I for one do not feel as though I would like to come here year after year expecting them to do it.

MR. PECK: I think it is right and proper we should indulge in entertainments to a moderate degree, but it should be at our own expense. It does not seem proper for the local secretary to undertake the responsibility of providing these extraordinary expenses for our entertainment. It is a responsibility which I should hesitate to undertake.

PRESIDENT: Allow me to say a word as a citizen of Detroit. I appreciate your feelings, at the same time, our position is a very easy one. The druggists of Detroit have not been burdened at all with this entertainment. The expense to the druggists in Detroit is very much smaller than when we go away. I think the members ought to come here and accept these entertainments freely and feel that they are doing what is right.

MR. CALDWELL: I think the entertainment is the best part of our meeting, and many druggists are forced to go, by their wives and daughters, on account of the entertainment.

MR. BROWN: I know personally of three or four young men, married clerks, who were prevented from coming to this meeting on account of the expense for entertainment tickets. While they considered the rate reasonable for the entertainment which was furnished, yet it prevented their coming. I therefore think that the expense of the entertainment should be as low as possible.

The motion of Mr. Alsdorf that there should be no entertainment given was lost.

MR. JESSON: There is another subject that I have in my mind, and that is the question of exhibits. Shall this Association continue exhibts or drop them?

PRESIDENT: Our constitution provides, I think, that we shall ask druggists and manufacturers to make exhibits. That is provided for by article 11 of the by-laws.

MR. JESSON: I will make a motion to amend the by-laws and strike that out. Our meetings have been very thinly attended because of the attraction in the exhibit hall. These men come here and want to sell goods, which is very commendable, and they desire to hold members there and they are thus kept from the meeting. There is nothing particularly instructive in much of the exhibit. I understand some of the exhibitors say they will not make another exhibit.

MR. BUGABEE: It seems to me this matter could be controlled by the Association, and that the exhibit should be composed only of those articles which are instructive to pharmacists. The exhibit hall should be closed during our meetings.

MR. JESSON: For the last two years the expense for the hall has been borne by us, and I would not be in favor of paying for a room for an exhibit in Detroit, as it is quite expensive.

MR. BROWN: I arise to a point of order. The point is that we cannot amend this by-law as Mr. Jesson suggests, because amendments to the by-laws must be in writing and must be read at one sitting and laid over until another, and then adopted by a vote of two-thirds of the members present.

The president held that the point of order was well taken.

MR. EBERBACH: As a rule I do not think these exhibits are very instructive, but we ought not to discard them altogether. It should be so arranged that we can control the exhibit.

MR. MERRITT: If we adopt any such plan, necessar-

ily we must bear the expense of the exhibit room, and we would not need a large one. If any one has anything that is of service to the retail pharmacist we would like to see it, and I think we ought to invite exhibits of that kind, and pay such expense as may be necessary to provide room for them. If we control it we can lock the doors and appoint certain hours when the exhibit will be open. In that way I think we would gain the point we are after and that the by-law contemplates.

MR. JESSON: I move that the matter of exhibits be left to the executive committee and local secretary.

Carried.

MR. DUPONT: I move that the usual amount be allowed the local secretary as compensation. It is not enough, but it is fully as much as we can afford.

The motion prevailed.

MR. ALSDORF: I move that we proceed to the election of a local secretary for the ensuing year.

Carried.

Mr. A. Bassett was then elected local secretary for the ensuing year.

SEVENTH SESSION.

ON BOARD THE STEAMER GREYHOUND.

FRIDAY, SEPTEMBER 7TH.

MR. BASSETT: Gentlemen of the Michigan Pharmaceutical Association: You will remember that we adjourned yesterday to meet for our closing session on this boat this morning. The meeting is now open for business.

Mr. Bassett then retired from the chair and the incoming president, Mr. Gundrum, assumed his duties. In doing so he said:

Gentleman, I thank you for the honor conferred on me in having elected me President of the Association. The coming year will be an important one, but I shall not shrink from any duty which is imposed upon me. I trust and expect that the members will support me in performing the duties of the office. I will now announce the committees for the year. In selecting the committees I have done the best I could under the circumstances.

The committee on Trade Interests will be Mr. A. Bassett, Mr. F. W. Fincher and Mr. G. T. Beach.

On Pharmacy and Queries, Dr. A. B. Prescott, Mr. O. Eberbach and Mr. S. E. Parkill.

On Legislation, Mr. John E. Peck, Mr. Jacob Jesson and Mr. James Vernor.

Committee on Adulteration, Prof. O. C. Johnson, Mr. H. W. Snow and Mr. S. A. Parker.

In appointing this committee the name of Prof. Johnson was suggested by the fact that we have had very few reports from the committee on Adulterations, and I believe Prof. Johnson will be able to assist us in this direction.

Committee on Unofficial Formularly, A. B. Stevens.

MR. BASSETT: Mr. President, Ladies and Gentlemen: At the meeting of this Association last year, when we were discussing the ways and means for increasing our membership, among other things suggested was the offering of a prize by the officers of the Association to the member who should bring in the largest number of new members during the year. We have had excellent work from many members and our membership has been increased over one hundred. One of our number who has made strenuous efforts in that direction, has carried off the prize, and I know of no other member of the Association whom we had rather see receive it than that person. He has worked early and late, he has used every effort at his command,

and he has gone through every drug store in the city of Detroit asking the persons there if they belonged to the Association. If he found they did not he would ask them where their certificate of registration was, and after he had thus somewhat frightened them he would ask if they had not better join the Association, and I assure you that there were not many who dared withstand that. As a result of this gentleman's labors he has brought in fifty-three members, while our worthy past Secretary has attempted to steal his thunder by putting his name on the applications so as to show he should have a greater number, but we checkmated him yesterday and blocked his little game. We have secured some pieces of gold which we have joined together and have had engraved with suitable sentiments, representing our appreciation of the work done by this man, and I now take great pleasure in stating to you that by reason of his work this medal belongs to Mr. James Vernor, of Detroit. (Applause.)

MR. VERNOR: Mr. President and Gentlemen: I feel both glad and sorry at this result. I entered into this competition in friendly rivalry, and I think you will all admit that although I secured a large number of applications, I did it, not for the medal especially, for I greatly hoped that some one would exceed me in point of numbers. I hardly think it is fair to inquire into my method of getting members, but I got them and that was the main thing. I hoped that we would have three hundred instead of one hundred, and in this hope I place this badge upon myself for one year, at the end of that time it will be placed upon the member who brings in the largest number of candidates during the next year. I thank you for the medal and hope I shall be compelled to give it to somebody else.

MR. PARKILL: It is somewhat necessary that I should make a brief explanation. Our worthy friend, the ex-president, was also a competitor for the medal. He signed

several of these applications and when he discovered that he had only six credited to his account, finding that it required that another should sign the application also, he said, "Here, Parkill, by putting your name on here you are liable to get the medal," while he was after it all the time himself, and now he takes advantage of it in this way.

With the consent of the Association I have a resolution which I desire to offer:

WHEREAS, The druggists of Detroit by their generous entertainment, hospitality, and continued attention to the visiting members of the M. S. P. A. have made our sixth annual meeting the most pleasant and memorable of all the meetings of our Association, contributing by their admirable arrangements not only to the pleasure, but to the profit and instruction to be derived therefrom as well, therefore, be it resolved by the M. S. P. A., in convention assembled, that we express our thanks to the druggists of Detroit for their hospitality and efforts in our behalf.

Resolved, That in the indefatigable labors of Mr. Vernor we recognize the factor most instrumental in the success of this meeting, and that we tender him our thanks for his labors, the results of which rest as a personal obligation on us all.

The resolutions were unanimously adopted.

MR. WELLS: I have a resolution I would like to offer:

Resolved, That the meeting of the M. S. P. A. and the A. P. A. is a notable event in the history of pharmacy in Michigan.

Resolved, That this meeting, permitting as it has, an opportunity to our members to come into personal relations with and listen to so many men long known to us through their writings and other efforts in advancing the interests of pharmacy, has been most interesting and valuable to us.

Resolved, That we tender to these men and to the A. P. A. our high appreciation of the work they are doing, and our hope and belief that in the future as in the past, this Association may be found contending earnestly for placing our chosen profession upon the high plane its character and merits demand.

Unanimously adopted.

MR. JESSON: We have with us a gentleman well known to us all I believe, Prof. Remington.

Prof. Remington having been called upon by the President, addressed the Association as follows:

Mr. President and Gentlemen of the Michigan State Pharmaceutical Association: I very much regret that my duties in the American Pharmaceutical Association have prevented me from meeting with you as I had hoped to during your sittings. I feel that this meeting has been the greatest meeting we have ever had and I am glad that the two Associations have come together under such favorable auspices. I do not know that any of you have been benefitted by coming to the meetings of the A. P. A. and it may be for this reason. I have noticed one thing about you and it is a splendid attribute and prophetic of success, and that is that you stick together. I tell you gentlemen that unity is an aid to success; and in any Association if you work together you must succeed. Your efforts in this direction have been noticeable and you have succeeded in putting one of the youngest Associations in the country to the front. Now, on behalf of our Association, of our State, of our college, I know that I express the sentiment of each one of them when I bid you God speed. The profession of pharmacy needs all the help it can get, and we don't want any jealousies nor contentions. We have a great country and there is room for every one who does good work, to come together and make an institution of which everyone would be proud. It is one of the greatest body of pharmacists that was ever gathered together in the world. I had the pleasure of going to the British Pharmaceutical conference and I have had the pleasure of going before other bodies, but there is no body which covers as much ground and which has as many active members as the American Pharmaceutical Association, and I believe it is united on all the interests that effect pharmacy in this country. We have little differences of opinion, but we could not exist and grow without them. To cite an illustration: A considerable number of our body thought we had made a mistake in fixing San Francisco as the place of meeting, yet those men who were most outspoken in their opposition, when it was once decided to go, were the first to say we will go too, and will do all we can to help you out.

MR. WELLS: I move that a vote of thanks be tendered to Parke, Davis & Co., on the part of the Michigan State

Pharmaceutical Association for their hospitalities extended to us and to the American Association.

The motion prevailed.

Dr. Eccles was then called for and responded as follows:

I don't know but you have called upon the wrong man this time. Although I have crossed the Atlantic a good many times without difficulty, I must confess that this trip has caused reversed parastetis in me that is rather uncomfortable.

MR. VERNOR: Has anybody any soda mint?

DR. ECCLES: It is a long time since I was on this lake before, and then everything was calm. I was on my way to Mackinac and didn't need any soda mints, because I had not been out late at night. Possibly when we come to Detroit some time in the future and Parke, Davis & Co. give us another fine collation and we go into the tent we will need soda mints, but I did not go into the tent so that is not the cause of my reversed parastetis. The meeting, Mr. President, has been a grand affair and I have enjoyed it greatly.

Mr. J. M. Maisch, Permanent Sec'y of the A. P. A., was then called upon and said:

Mr. President, Ladies and Gentlemen: It is rather unexpected to be called upon at this time to make a speech and you must not expect from me the flow of language of the gentleman who just preceded me. I am not good at speech making. I am more accustomed to work than talk.

I visited the City of Detroit the first time twenty-two years ago, when the A. P. A. made its first visit here, and the second year of my Secretaryship of the Association. At the present time, having been continuously in the office of the Secretary, I can look back upon a large number of meetings. Twenty-two years ago the meeting was a small one compared with this. I remember very well that our headquarters then were at the Russell House. The interior of the House was somewhat different from what it is now. I remem-

ber there was a rotunda and we got together there in time to say good-bye and we stood there and sang Auld Lang Syne. It made quite an impression upon us I remember at the time. It is always a pleasure to meet men and it is always sad to part at the end of the meeting.

I am sorry I did not have the opportunity of paying a visit to the sessions of the Michigan Association. I know a good deal about the Association, and what I know is to its credit. I know there are workers in the Michigan Association and that their work has resulted in great good. I must say, and it is not intended as a mere empty compliment to your Association, that I wish every State Association had as many such workers as you have. I thank you for giving me the opportunity of speaking to you.

MR. JESSON: We have with us here another gentleman who was present at the meeting 22 years ago, Mr. Ebright, of Chicago.

MR. EBRIGHT: *Mr. President and Gentlemen:* I came in just in time to hear what Mr. Maisch said, and I had an idea that he told you all about our previous meeting in Detroit. I happened to be one of the few men who met here at that time. I think, however, that the professor made an error in saying that we stopped at the Russell House. We stopped in the Biddle House, where we had our meeting.

PROF. MAISCH: You are mistaken.

MR. EBRIGHT: Well, I want to say, then, that they have changed the Russell House very much. The old Biddle was where we held our meetings, and where the rotunda was, I think, although if I am mistaken I am willing to be corrected. Having attended the meetings since then pretty regularly, I cannot recollect of having a more pleasant meeting than we had in the city of Detroit at that time. And this certainly surpasses that meeting, because in the intervening time we have become an immense body of pharmacists where there was then but one man. There was but a single member to welcome the A. P. A. in 1856, and since then you have swelled to nearly a thousand, and now when we come here the right hand of fellowship has been extended to us in a most cordial manner. I thank you for the delegation of Illinois which I represent, for the kind hospitality and treatment you have given us. I hope you will send a large delegation to San Francisco to be welcomed by members upon the Pacific coast. I thank you for your attention.

The Association then adjourned to meet in the city of Detroit on the 10th day of September, 1889.

In Memoriam.

G. B. DUNN, Burr Oak.

WM. JOHNSTON, Detroit.

R. L. LATIMER, Jackson.

J. D. PETRIE, Kalamazoo.

H. T. REED, White Cloud.

THEO. ROUNEFELD, Detroit.

T. RUDOLPHI, Dowagiac.

EZRA WEAVER. Reading.

ANSWERS TO QUERIES,

— AND —

VOLUNTEER PAPERS,

READ AT THE SIXTH ANNUAL MEETING IN DETROIT.

Assay of the Tinctures of Nux Vomica.

BY H. A. PASSOLT,

SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

There is perhaps no one tincture which is so important and on which so much has been written as on that of Nux Vomica. The many analyses which have been made show that the tincture varies greatly in strength, and is therefore very uncertain in its action, and sometimes even dangerous.

The method of assay used was the ready method of Dr. A. B. Lyon, as given in his "Pharmaceutical Assaying."* The specific gravity of the tincture was first taken by means of a specific gravity bottle. Then 25 c. c. were evaporated in a beaker on a steam bath until a constant weight was obtained. This gave the amount of solid extract. This extract was then treated with one c. c. of five per cent. solution of sulphuric acid and 10 c. c. of warm water, and run into a separatory funnel, rinsing out the

* LYON, 1886: "Pharmaceutical Assaying," p. 114. Compare process of DUNSTAN and SHORT, 1883: *Phar. Jour. Trans.* [3] *12*, 665; presented by Lyon in 1885: *Proc. Mich. State Phar. Assoc.*, *2*, 183. Further, PRESCOTT'S "Organic Analysis," 1887, p. 456.

beaker with a little ether and a few drops of water, and adding to the portion in the funnel.

The acid portion was then washed with two separate portions of ether (15 c. c.) and finally with a mixture of ether three volumes and chloroform one volume.

The aqueous portion containing the alkaloids was treated with strong ammonia, and then agitated three times successively with mixtures of ether and chloroform.

The etheral portions were then filtered, evaporated on a water bath and the residue calculated as total alkaloids. The strychnine was estimated by means of potassium ferrocyanide* but the results were by no means accurate. The specific gravity of the tincture made according to the U. S. P. should be about 0.8525; should contain two per cent. of extract and about 0.3 of total alkaloids. It will thus be seen that most of the pharmacists used an alcohol stronger than that required by the U. S. Pharmacopœia.

The following given results were obtained upon samples of Tincture of Nux Vomica obtained in Dispensing Pharmacies in Michigan. Eleven of the samples were obtained from towns in the Saginaw Valley; one was obtained in Ann Arbor.

No.		Specific Gravity.	Per Cent. of Extract.	Per Cent. of Total Alkal'ds.
1.	---------- ------	0.8613	2.61	0.334
2.	------ ----------	0.8548	4.85	0.716
3.	------ ----------	0.8492	2.34	0.401
4.	------ ----------	0.8473	2.90	0.485
5.	---- ----------	0.8453	2.41	0.340
6.	-------- ----------	0.8490	1.00	0.245
7.	---------- -------	0.8219	0.73	0.149
8.	------ ----------	0.8181	2.82	0.353
9.	---------- -------	0.8181	1.53	0.313
10.	-------- ----------	0.8181	1.07	0.241
11.	---------- ----------	0.8176	2.81	0.429
12.	------ ----------	0.8161	2.27	0.370

References to the Literature of the Assay of Nux Vomica:

* Dunstan and Short, 1883.

DUNSTAN and SHORT, 1883: *Phar. Jour. Trans.*, London, [3] *13*, 665, 1055; *Am. Jour. Phar.*, *55*, 268; *Year-Book of Pharmacy*, 1883, 469, 475. 1884: *Phar. Jour. Trans.* [3] *14*, *1*, 290, 292, 443; *Proc. Am. Phar. Asso.*, *33*, 130.

ECCLES, 1886: *Phar. Record*, New York, *6*, 86.

LYON, 1885: *Proc. Mich. State Phar. Assoc.*, *2*, 183. 1886: "Phar. Assaying," page 114. 1888: *Phar. Era*, Detroit, *2*, 30, 66.

MARTIN, 1886: *Phar. Jour Trans.* [3] *17*, 253; *Year-Book of Pharmacy*, 1886, 507.

PRESCOTT, 1878: *Proc. Am. Phar. Assoc.*, *26*, 806; *New Rem.*, New York, *8*, 11; *Year-Book of Pharmacy*, 1879, 97. 1887: "Organic Analysis," page 456.

SCHACHT, 1884: *Phar. Jour. Trans.* [3] *14*, 851; *Year-Book of Pharmacy*, 1884, 275.

SCHWEISSINGER, 1885: *Archiv. der Phar.*, August, p. 579–590; 609–621; *Proc. Am. Phar. Assoc.*, *34*, 407; *Am. Druggist*, *14*, 230.

The Constituents of Buchu.

BY ALBERT ŒCHSLER,

SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

The work here reported upon was confined to the variety known as Short Buchu, *Barosmà betulina*. The other two varieties, as is well known, are *Barosma serratifolia* or Long Buchu leaves, and *Barosma crenulata*, the last named variety being in length of leaf usually intermediate between the other two.

The general plan of the analysis was as follows, taking one avoirdupois pound of the drug: first distillation with steam, then exhaustion, sucessively, with water, benzin, and alcohol.

The drug, in moderately coarse powder, was moistened with water, packed in a suitable percolator fitted with a rubber top connecting with a condenser, and steam was passed through the percolator for several hours. Shortly after the distillation commenced there appeared an oil layer upon the surface of the distillate. For further separation of the oil, the distillate was saturated with common salt. The oil was then decanted, and purified by dissolving in ether and filtering through a paper filter previously wet with ether, this solvent being allowed to evaporate off in a current of air at ordinary temperature.

The recovered oil amounted to 0.452 per cent. of the drug taken. The oil was of a light brown color, and an agreeable odor, reminding, as Flückiger has remarked, of the odor of oil of peppermint.

When subjected to low temperatures oil of buchu deposits a camphor. This camphor was first observed by Professor Flückiger, who obtained it in proportion of a little over 0.5 per cent. of the oil, in an operation upon 180 grams of the latter. The camphor, or stearopten, was named DIOSPHENOL by Flückiger. Its chemical composition, as afterwards corrected by R. Spica, was placed as $C_{10}H_{61}O_2$, but the molecular weight could not be verified by vapor density, owing to partial decomposition in vaporization. He inferred the structure to be that of a phenylic ether, with one phenol hydroxyl group. Spica purified this compound by drying the crystals between blotting papers, then recrystallizing from alcohol by diluting the alcoholic solution until it was slightly turbid. Needle-shaped crystals were obtained.

The crystals melt at 82°C. (Spica), 83°C. (Flückiger), and boil at 220°C. (Spica), 233°C. (Flückiger), with some decomposition (Spica). The crystals dissolve readily in alcohol, and are soluble in aqueous fixed alkalies, from solutions in which acids precipitate the camphor. The

characteristic mint-like, camphoraceous odor is obtained from solution in the neutral solvents, not from the alkaline solutions.

It may be here added that an elæopten, constituting two-thirds of the oil, and giving elementary figures corresponding to $C_{10}H_{18}O$, was obtained by Spica, who separated it by its insolubility in aqueous alkalies. It occurs mainly in the oil first distilled. Though insoluble in aqueous alkalies, continued action of alkali gives, among other matters, a camphoraceous oil of an odor and taste resembling thymol. J. W. England has shown that the constituents of oil of buchu, the stearopten and elæopten, doubtless of phenylic structure, by action of caustic soda yield some salicylic acid,—whereby it is explained why Prof. Wayne found salicylic acid in oil of buchu, and why this result was not confirmed by Prof. Maisch.

After the treatment with steam for separation of the oil, as described above, the mass of powdered buchu, was thoroughly exhausted by percolation with water, and an aliquot part of the percolate, considerably colored with chlorophyl, was precipitated with alcohol, filtered through counterpoised filters, and the precipitate washed with alcohol, dried and weighed. The yield was 7.177 per cent. of the drug first taken.

The drug as so far exhausted was dried, repacked, and percolated with petroleum benzin, until the percolate became colorless. On evaporation of the benzin, the residue, semi-solid and dark colored, amounted to 3.09 per cent of the weight of the drug taken. This residue was partly soluble in alcohol, and was not at all saponified with potassium hydrate. The portion soluble in alcohol was precipitated with water, so far agreeing with resins. The portion insoluble in alcohol had a bland oil-like taste.

Lastly the drug, as exhausted by the solvents already applied, was percolated with alcohol. The percolate, of a

light brown color, was taken in an aliquot part of it, precipitated by acidulated water, filtered, and then dissolved off of the filter by another application of the alcohol, when the alcoholic filtrate with washings was evaporated in a tared dish. The yield of this precipitate was 1.12 per cent. of the drug.

Recapitulating, the estimations were as follows:

Essential Oils of Buchu, by treatment with steam	0.45 per cent.
Soluble in water, but precipitated by alcohol	7.18 " "
Soluble in benzin, after removal of above and including a certain amount of resin	3.09 " "
Soluble in alcohol, precipitated by water (resins)	1.12 " "

The following references to the Literature of the Chemistry of Buchu are offered without any attempt to present a complete bibliography of this subject:

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MAISCH, J. M., 1881: The Stearopten of Buchu Leaves: *Am. Jour. Phar.*, *53*, 331. Non-existence of Sal-

icylic Acid in Buchu Leaves: *Ibid.*, *53*, 333; *Proc. Am. Phar. Assoc.*, *30*.

OSSE, O., 1876: *Zeitscher. Oest. Ap. Ver.*, 1875, p. 441; *Proc. Am. Phar. Assoc.*, *24*, 276.

REMINGTON, J. P., 1873: Extraction of Medicinal Constituents of Buchu with Petroleum Benzin not possible: *Proc. Am. Phar. Assoc.*, *21*, 592.

RITTENHOUSE, H. M., 1854: Pharmaceutical Observations upon Buchu; *Am. Jour. Phar.*, *26*, 484.

SPICA, R., 1886: Buchu and Essential Oil of Buchu: *Am. Jour. Phar.*, *58*, 175.

Squibb, E. R., 1878: Exhaustion of Buchu by Dilute Alcohol: *Proc. Am. Phar. Assoc.*, *26*, 709.

WAYNE, E. S., 1876: Researches upon Buchu: *Am. Jour. Phar.*, *48*, 18.

DISCUSSION.

PROF. STEVENS: The long buchu generally brings a higher price than short. It is stated that the effect of buchu depends upon the oil which it contains. If such is the case it seems that the prices are wrongly placed, because the short buchu contains a larger percentage of oil.

Mayer's Reagent for the Estimation of Alkaloids.

BY H. W. SNOW, PH. C.

Two years ago Dr. A. B. Lyon presented to this Association a paper on the estimaton of Alkaloids by Mayer's Reagent, which is I believe the most exhaustive and thorough paper ever published on this subject. In fact it is my opinion that comparatively little remains to be said, at least so far as immediately practical results are concerned and consequently I feel some hesitation in traveling again over the same ground particularly as the experiments per-

formed by me have been far more limited in number than those from which Dr. Lyon drew his conclusions. It is therefore desirable to say at once that this paper is intended more particularly to draw attention to a method of interpretating the results of titrations rather than with the expectation of advancing any new hitherto unknown facts bearing on the use of this reagent. In your proceedings of last year in connection with the assay of ipecac and again at a later date in connection with the assay of aconite, in the *New Idea*, I gave tables for the interpretation of the results of titrations of the alkaloids contained in those drugs and it is these tables somewhat extended and similarly applied to a number of alkaloids that I wish to again bring forward in a paper immediately upon the subject of Mayer's reagent. The experiments which form the basis of this paper have been performed at odd intervals during a year or more past and were primarily undertaken with a view of familiarizing myself to some extent with the peculiarities exhibited by the different alkaloids on treatment with Mayer's reagent. The experiments though not bringing forward much that is new may stand in some measure at least as confirmations of earlier work and thus give increased value to that which has preceded. The method of interpretating the results of titrations is very simple, and consists first, in determining the titration equivalents for the alkaloid in different degrees of dilution. Then, when working on unknown material, by holding the initial fluid always constant the number of cubic centimeters of reagent required to precipitate the alkaloid becomes an index to the degree of dilution of the alkaloid and thus enables the analyst to select the true experimental equivalent for calculating the weight and finally the precentage of alkaloid. The full details of calculating the tables are most easily understood by following out the actual work on an alkaloid and this is given for sake of illustration in connection with aconitine.

MANNER OF USING THE TABLES.

The manner of using the tables is the same for all the alkaloids and in illustration let us take aconitine. Bring the volume of fluid containing the alkaloid to the volume indicated at the head of the table in our instance 20 c. c. titrate with the reagent as hereinafter described and note the amount required to completely precipitate the alkaloid. Suppose that from 10 grammes of aconite root, the alkaloid required 4.8 c. c. of reagent, referring to our table we find that this indicates a dilution of 1 part in 300 and that the experimental equivalent for the alkaloid in that degree of dilution is .014, then $(.014 \times 4.8) \times 10 = 0.67\%$ alkaloid. Instead of 4.8 c. c. suppose that 6.3 c. c. had been required; again referring to our table we note that this indicates a dilution between 1 part in 200 and 1 part in 250 and the equivalent to use in the calculation might be taken for either degree of dilution, or if for any reason we desired to split hairs .01415 might be taken as the average between .0142 and .0141, this would give us a precentage of $(.01415 \times 6.3) \times 10 = 0.89\%$ alkaloid.

THE REAGENT.

The reagent recommended by Mayer* contained 13.55 grammes of corrosive sublimate and 50 grammes of Iodide of Potash to the litre and was denominated then and has since been considered as a decinormal solution. If we reduce the molecular weight of mercuric chloride to the hydrogen equivalent of the mercury, one-half of 271, the same as the equivalent in the old notation, we may still regard Mayer's reagent as decinormal. All titrations and tables in this paper refer to a solution containing 6.775 grammes of mercuric chloride and 25 grammes of Potassium Iodide to the litre, a solution consequently of half the strength of that originally recommended by Mayer, and, on the basis just mentioned, decinormal in standard.

*Amer. Jour. Phar. 1863—20 from Proc. Amer. Phar. Asso. Aug. 1862.

METHOD OF TITRATION.

As the method of titration, in some instances at least, influences the results, it is recommended, that all who may use these tables should pursue the following convenient course.* Run in from ½ to 1 c. c. of the reagent and after stirring allow to stand one or two minutes before again running in a like quantity and as before after stirring allow to stand a minute or two, finally as it becomes apparent that the end reaction is nearly reached the fluid is to be passed through a small *dry* filter paper, best of a size to just conveniently hold all of the liquid, allowing most of the fluid to pass through before again testing with a drop of the reagent. The final end is best determined by taking out about four or five drops of the filtrate in a watch glass placed on a dark surface and adding one drop of the reagent. If a precipitate does not appear on standing half a minute or so the end may be considered as reached. If a precipitate does appear the fluid must be returned to the main portion and the operation continued.

ACONITINE.

The writer reported a number of experiments on this alkaloid some time ago.† Results of titrations are on the whole very satisfactory, end reaction is quite distinct and well marked. The alkaloid may be regarded as belonging on the list of those for which Mayer's reagent may be used advantageously as a means of estimation. Experiments show that each cubic centimeter of the reagent precipitates in faintly acid solutions amounts as follows for different degrees of solutions:

1 in 200 = .0142 grammes.
1 in 300 = .0140 "
1 in 400 = .0136 "
1 in 500 = .01286 "
1 in 600 = .01163 "

*The method of A. B. Lyon slightly modified for the determination of the final end.

†Pharm. Era II—20 from New Idea, Oct. 1887—616.

The precipitates from 0.100 grammes of alkaloid when collected, dried and weighed ran from 0.162 to 0.179 with an average of 0.173 corresponding to 55.9% to 61.7% with an average of 57.8% alkaloid. It is observed that aconite root and fluid extracts of the drug contain not far from 0.75% of alkaloid as an average reckoned as aconitine. Occasionally the amount will exceed 1% and rarely fall below ½%. It will also be noted that for dilutions of 1 part in 200 to 1 part in 300 the alkaloid gives the best results in titration, while for less than 1 part in 400 the results begin to vary considerably. It is therefore evident that a dilution should be adopted in which the alkaloid shall be present in from 1 in 200 to not less than 1 in 400 and in the case of fluid extracts this dilution would be 20 c. c. representing 10 c. c. of fluid extract and therefore this dilution was adopted.* The figures in the table were obtained as follows: A fluid measuring 20 c. c. may be said to weigh 20 grammes. If it contains 1 part in 200 of alkaloid it is evident that there is 0.100 grammes of alkaloid (20.0 ÷ 200 = 0.100) in it. In a dilution of 1 in 200 Mayer's reagent precipitates .0142 of alkaloid and 7.04 c. c. of reagent would be required to precipitate the whole of the alkaloid. This gives the last figure for the first column, the equivalent goes into the third column and the degree of dilution makes up the second column. For 1 in 500 a similar course is followed not forgeting that in dividing the weight of alkaloid by the equivalent we must use the equivalent for 1 in 500 and not for 1 in 200 as in the first case and this is true for all the data in the first column.

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*10 c. c. of a fl. ex. or 10 grammes of a drug containing 1% of alkaloid would yield when diluted to 20 c. c. a flluid containing 1 part in 200 of alkaloid. If it only contained ½% alkaloid it would correspond on diluting to 20 c. c. to a fluid containing 1 part in 400 and it will thus be seen the range is the one best suited to determinations of the alkaloid.

On this basis the following table was constructed for the interpretation of the results of titration:

The fluid measures 20 c. c. † and contains 2 c. c. of 1% by vol. Sulphuric acid. ‡

c. c. Required for Precipitation.	Dilution.	Equivalent.
3.11 §	1 in 500	0.01286
3.37	1 in 450	0.0131 *
3.68	1 in 400	0.0136
4.13	1 in 350	0.0138 *
4.76	1 in 300	0.0140
5.67	1 in 250	0.0141 *
7.04	1 in 200	0.0142

* In the case of this as in that of all other alkaloids mentioned in this paper the equivalents marked with an asterisk are interpolations, all others were experimentally determined.

‡ The volumes given at the head of the tables refers to the volume which the fluid should have at the beginning of the titration.

§ In practice reading is of course only to tenths of c. c. but in the tables readings are calculated to hundreth for purposes of mathematical exactness; they may always be read to the nearest tenth.

† I originally recommend 30 c. c. as the dilution best suited for this table intending thus to include those drugs containing as much as 1.2% to 1.3% alkaloid but as these are rather the exception than the rule, the smaller volume as pointed out by the Ed. of Pharm. Era is to be preferred. The 30 c. c. table likewise a 25 c. c. table are however given as they may sometimes be of use.

25 c. c. Table. Fluid Containing 2½ c. c. of 1 per cent. by Vol. Sulp. Acid.			30 c. c. Table. Fluid Containing 3 c. c. of 1 per cent. by Vol. Sulp. Acid.		
c. c. Requl'd	Dilution.	Equiv.	c. c. Requl'd	Dilution.	Equiv.
3.89	1 in 500	.01286	4.31	1 in 600	.0116
4.21	1 in 450	.0132 *	4.67	1 in 500	.01286
4.59	1 in 400	.0136	5.05	1 in 450	.0132 *
5.17	1 in 350	.0138 *	5.51	1 in 400	.0136
5.95	1 in 300	.0140	6.21	1 in 350	.0138 *
7.09	1 in 250	.0141 *	7.15	1 in 300	.0140
8.80	1 in 200	.0142	8.50	1 in 250	.0141 *
			10.56	1 in 200	.0142

BERBERINE

Gives very favorable results on titrations with Mayer's reagent. My own results for titrations in dilutions for 1 in 200, 1 in 400 and 1 in 600 showed an equivalent somewhat smaller than that found by Dr. Lyon but on the whole I prefer to accept the results of his work † and the following table is constructed on his equivalents:

Fluid measures 40 c. c.‡ and contains 4 c. c. of 1% by vol. of Sulphuric acid.

c. c. Required.	Dilution.	Equivalent.
3.06	1 in 600	0.0218
3.36	1 in 500	0.0238 *
3.57	1 in 450	0.0249 *
3.89	1 in 400	0.0257
4.43	1 in 350	0.0258 *
5.13	1 in 300	0.0260 *
6.11	1 in 250	0.0262 *
7.60	1 in 200	0.0263

BRUCINE.

Titrations of this alkaloid are far from satisfactory. Results are apt to vary widely and on comparatively little

† For 1 in 200, 1 in 400 and one in 600, I found 1 c. c. of the reagent to precipitate respectively 0.0257, 0.0218 and 0,0186 of alkaloid. I believed at the time that my alkaloid was not quite pure and in this case the presence of a small amount of Hydrastine would lower the equivalent considerably as 1 c. c. of the reagent only precipitates of this alkaloid 0.0101. With an alkaloid giving as good results as Berberine is reported and seems to give, it is likely that the highest equivalent obtained would be the most nearly correct.

‡ In applying Mayer's reagent to Hydrastis probably a dilution of 20 c. c. representing $2\frac{1}{2}$ grammes of drug would be better than 40 c. c. but in any case titrations for this drug give at best only a rough idea of the value of the drug and can hardly be regarded as having comparative value owing to the wide difference between the titration equivalents of Hydrastine and Berberine. Here we must be content to state results as "so many" c. c. of reagent to each gramme of drug or c. c. of fluid extract.

provocation. When a series of equivalents were obtained which agreed among themselves, the following were the results:

1 in 200, .01059; 1 in 300, .01025; 1 in 400, .01016.

It will be seen that these figures differ quite materially from those of previous experimenters and it is scarcely worth the trouble to calculate a table for the correction of the results of titrations as probably the alkaloid will never be estimated by this means.

BRUCINE AND STRYCHNINE IN MIXTURE.

With the two alkaloids in mixture varying from 60% to 35% strychnine and in solutions containing 1 part in 200 of the mixed alkaloids, the average equivalent of four titrations was found to be .0095. For rough comparisons of samples of nux vomica this equivalent might be used, but ordinarily it is best to estimate the alkaloids by their weight.

EMETINE.

The equivalents for this alkaloid in different degrees of dilution were presented to this Association at its last meeting.* Detailed comment is unnecessary here, as it was given last year by myself and has been considered quite fully by others in different places. The tables to follow are the same as those which I have already given but are now offered in greater detail. Observation shows that with the presence of only small amounts of free acid 1 c. c. of the reagent precipitates as follows:

1 in 200 — .0109
1 in 300 — .0105
1 in 400 — .0102
1 in 500 — .0100
1 in 600 — .0095

* Proc. M. S. P. A., 1887, p. 93 et seq. also in Pharm. Era I—400 et seq.

The precipitate from 0.100 of alkaloid, after drying, weighs on an average, 0.245 grammes corresponding to 40.81% alkaloid. These equivalents are not very different from those offered by Dr. Lyon and it is not a matter of great consequence which are used in calculations.

Fluid measures 30 c. c. † and contains 3 c. c., 1% by vol. Sulphuric acid.

c. c. Required.	Dilution.	Equivalent.
6.00	1 in 500	.0100
6.60	1 in 450	.0101 *
7.35	1 in 400	.0102
8.32	1 in 350	.0103 *
9.52	1 in 300	.0105
11.21	1 in 250	.0107 *
13.76	1 in 200	.0109

GELSEMINE.

My own experience, though limited, confirms previous unfavorable reports on estimations of this alkaloid by means of Mayer's reagent. The end reaction is far from being distinct or satisfactory. I have made only one series of titrations on known material and though results agreed among themselves fairly well, they differ from previous published statements. This is not to be surprised at, for, in addition to general unsatisfactory results, it may also be said that the commercial gelsemine is most likely a very variable product. However, I have allowed my results to stand as they were obtained. It has been pointed out that phosphomolybdic acid will most likely supersede in the estimation of this alkaloid.‡ A table, however, is given for corrections based on the observation that in slightly acid solutions 1 c. c. of reagent precipitates

1 in 200, 0.0109; 1 in 400, 0.0090; 1 in 600, .0078.

† This dilution is suited to 2½ grammes of drug or 5 c. c. of fluid extract or about 0.750 to 1,00 gramme of solid extract.

‡ Writer before Amer. Phar. Ass., Sept., 1888.

The precipitates when collected immediately on counterpoised filter papers, washed, dried, and weighed, average about 0.205 from 0.100 grammes, corresponding to 49% alkaloid.

(Fluid measures 15 c. c. † and contains small amounts of acid.)

c. c. Required.	Dilution.	Equivalent.
3.20	1 in 600	.0078
3.57	1 in 500	.0084 *
4.17	1 in 400	.0090
4.55	1 in 350	.0094 *
5.10	1 in 300	.0098
5.77	1 in 250	.0104 *
6.88	1 in 200	.0109

HYDRASTINE.

The end reaction with this alkaloid is not very distinct, but by using care in noting the end, as already indicated, duplicate titrations may be made to agree quite closely. The titrations were all made in a solution containing .1% by volume of Sulphuric acid, four being made for 1 part in 200 and 2 for one part in 500, which, agreeing closely, gave averages respectively of 0.0101 and .0076. These equivalents are considerably lower than those offered by A. B. Lyon, which may perhaps be accounted for by the difference of acidity in the solutions titrated. In the case of my own I can specify the exact amounts of acid used and in titrations where this can be controlled, the equivalents, I think, can be relied on. If the acidity is not under control, I should be inclined to doubt the results of titrations. The mere fact that two observers working independently with an alkaloid like Hydrastine should obtain such widely discrepant results shows that slight variations in the conditions will effect the results. The acidity seems to be the point on which we differed. As

† Probably best suited as a representative of 25 grammes of drug or 25 c. c. of fluid extract.

already stated, my titrations were made in solutions containing .1% by volume of Sulphuric acid. The four determinations for 1 in 200 showed respectively .0100, .0100, .0101 and .0102, while for one in 500 the equivalent was found to be .0075 and .0077. The precipitates from 100 of of alkaloid, when collected immediately, washed and dried, averaged 206, corresponding to 48.5% alkaloid. Ordinarily it cannot be said to be advisable to determine two equivalents so widely separated as these dilutions were and then interpolate intermediate equivalents for reasons which will readily be understood by noting the equivalents for Aconitine or Berberine. In the case of Hydrastine, however, it seems permissible and consequently it has been followed in the table.

Fluid measures 20 c. c. and contains 2 c. c. of 1% by volume Sulphuric acid.

c. c. Required.	Dilution.	Equivalent.
5.26	1 in 500	.0076
5.81	1 in 400	.0086 *
6.35	1 in 350	.0090 *
7.09	1 in 300	.0094 *
8.16	1 in 250	.0098 *
9.90	1 in 200	.0101

SANGUINARINE.

Dragendorff, on the results of some experiments of Masing's, hazards a guess that the titration equivalent of Sanguinarine will be found to be .00743. Calculation shows that this is a theoretical equivalent based on Flückiger's formula, for the alkaloid ($C_{17}H_{15}NO_4$—29.7—1-40 of 297 = .00743) and assuming $C_{17}H_{15}NO_4HI.\ HI_2$ as the composition of the precipitate. My own results are widely at variance with this figure. A number of titrations have been performed of which the following are averages:

1 in 200 — .0183
1 in 300 — .0178
1 in 400 — .0173
1 in 500 — .0165
1 in 600 — .0155

Duplicates show some differences even when the conditions seem the same. The end reaction, however is sharp and well defined and approaches closely to Berberine and Strychnine in this respect. Like these alkaloids, also, the excess of reagent required to precipitate the alkaloid is small, at least in the stronger solutions, and on the whole the alkaloid may be ranked with those giving good results on titrations. Just what the action of its associated alkaloid, Chelidonine, is, I cannot say, though it would be very interesting to know. 0.100 of alkaloid yields a precipitate which, on collecting immediately, washing and drying, weighs from 0.180 to .206, with an average of 0.194, corresponding to 51.5% average alkaloid in the precipitate.

Fluid measures 30 c. c.† and contains 3 c. c., of 1% by volume, Sulphuric acid.

c. c. Required.	Dilution.	Equivalent.
3.64	1 in 500	.0165
3.94	1 in 450	.0169 *
4.34	1 in 400	.0173
4.89	1 in 350	.0176 *
5.62	1 in 300	.0178
6.63	1 in 250	.0181 *
8.19	1 in 200	.0183

STRYCHNINE.

My own experiments agree substantially with those of previous observers. For dilutions running from 1 in 200 to 1 in 400 but little variation is noticeable, and even up to 1 in 600 no correction seems called for. In a dilution of 1 in 200 to 1 in 400 the equivalent may be regarded as being from .0088 to .0090. The average weight of the precipitate is 0.265 from 0.100 of alkaloid equal to 37.7% and usually runs quite constant.

† Suited to represent grammes of Sanguinaria.

STRYCHNINE AND BRUCINE.

In mixtures see Brucine.

DISCUSSION.

PROF. PRESCOTT: I wish to express my gratification upon this investigation which has been continued with such good effect by Dr. Lyon, which is still in progress. It is in contemplation, of course, that Galenical preparations and all forms of vegetable drugs shall be made of definite strength and put under assay with definite requirements as soon and as far as possible, therefore the analytical chemist is called upon to furnish the means of valuation, and for all these drugs containing alkaloids as active principles, Mayer's reagent has been most depended upon. Great objections have been taken to it. Its results are very different under different conditions, but it must be admiited that almost every reagent, even those in quantitative analyses give widely different results unless the conditions can be made fixed and uniform. The necessity of governing the conditions of dilution, of time, of temperature and of preponderance of mass are apparent. This necessity must be borne in mind in all analytical work, especially in all assays.

Regarding the designation of Mayer's solution as deci-normal, I have been in the habit of styling it twentieth normal myself, but will remind Mr. Snow that the nomenclature is sometimes fixed on the hydrogen equivalent and not upon the molecular weight. Some persons take for a normal solution of sulphuric acid 49 and not 98. as the numerical factor.

MR. GUNDRUM: I move a vote of thanks be extended to Mr. Snow for his very valuable paper. I am glad we have amongst us a young man who will take up such work as this that has been heretofore in the hands of Dr. Lyon

The motion prevailed.

Examination of Agnine.

BY CHAUNCEY N. WATERMAN, SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

Some examination was made of the American article known as Agnine, and furnished to the writer by Theodore Metcalf, of Boston.

The inorganic constituents were estimated and found to be in scarcely weighable quantity. The agnine was found to be insoluble in water, hot or cold; forty per cent. of it dissolved in alcohol; and either ether or benzine apparently dissolves it all but on standing a short time a deposit falls out of this solution. The deposit from the benzine solution is in granulo-crystalline form, resembling urate of ammonia, under the microscope. Decinormal solution of potassium hydrate readily saponifies the greater part, but about five per cent. of the agnine resists saponification in this dilute alkali. With a strong aqueous solution, or alcoholic solution of the potash, on digesting at temperature melting the agnine, the latter rapidly saponified to an oily soap-like mass but when this is treated with hot water a residue of five per cent. of unsaponified fat is obtained. The watery solution gives qualitative tests for benzoic acid. When the residue of evaporation of the solution was acidulated with hydrochloric acid, again evaporated with care, and the residue heated in a small capsule, a sublimate of impure benzoic acid was obtained. On subjecting the agnine to dry distillation, while the thermometer placed in the retort above the liquid stood at 137° C., an oily distillate appeared, and continued to flow until the thermometer reaches 170° C. The distillate, tested for benzoates, gave negative results. A similar distillate was obtained in distilling the suint of sheep's wool along with petroleum spirit, by Thomas Taylor, in 1876. Tests were made as to the bases of the alkali soaps in ag-

nine, and a negative result was obtained for ammonia. Soda is almost wholly absent. Potash is the alkali base of the soaps. The benzoates in agnine agree in solubility with glyceryl benzoate, as the solubility of the latter is stated, namely: Insoluble in water, soluble in ether, or chloroform, or benzine, not in carbon disulphide. Unlike "Lanoline," agnine is nearly anhydrous, not yielding water when heated up to 125° C. It can be intermixed with about its own weight of water.

Estimation of Nicotine in Cigarettes.

BY JOHN H. SHARPER,

SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

The prevalence of cigarette smoking among young men is the occasion of so much concern that it seems desirable to have positive information of the chemical components of the cigarettes in use at present. Therefore the writer set out to determine, as fully as possible with the time at command for this purpose, the percentages of nicotine contained in cigarettes of brands in common use.

As many as five several methods of assay of tobacco were tried, more or less fully, before satisfactory results were reached in use of the method given in detail below. The methods tried may be named as follows: (1) As given by DRAGENDORFF in "Werthbestimmung starkwirkender Droguen," (page 55), from the work of Kosutany. Of the tobacco 25 grams were treated with one-third this weight of milk of lime, the mixture standing for twelve hours, when the mass was exhausted with pure water. From the filtrate the alkaloid was shaken out with petroleum ether, (benzin) in quantity one-fourth that of the filtrate. The benzin solution was then shaken out with an exactly measured quantity of tenth-normal solution of sulphuric

acid, and the acid solution then titrated back with tenth-normal potassium hydrate solution. The excess of sulphuric acid so found was calculated into nicotine, in the proportions for nicotine sulphate. (2) A modification of the method just given, and one also indicated by Dragendorff,* consists in digesting the tobacco in a flask with an exactly weighed quantity of water very slightly acidulated with sulphuric acid, the quantity of this solvent being about ten times that of the tobacco, and the acidulation five drops of one-to-eight diluted sulphuric acid to 50 c. c. of water. The flask and contents were at once tared, the digestion continued for twenty-four hours, then water added to bring the weight up to the tare, when the mixture was filtered through a dry filter, without washing, and a convenient portion of the filtrate was taken by weight as an aliquot portion of the entire quantity of the solvent added at first. The filtrate was made alkaline and skaken out with benzin and therefrom estimated by its saturation of volumetric sulphuric acid as in method number (1). (3) The method of J. Skalweit as given in Lyon's Pharmaceutical Assaying† was experimented upon. (4) A brief trial was made of a method of distillation of the alkaloid. ‡ The results of number (1) were unsatisfactory; those by method number (2) were a little better, and indeed better than obtained in following either number (3) or number (4).

(5) The method of assay adopted was a simplication of number (2), estimating with Mayer's solution instead of alkalimetry, as follows: The tobacco was dried, three

* "Werthbestimmung," page 11.

† From *Archiv der Phar., 19*, 36-41, July, 1881; *Am. Jour. Phar. 54*, 60, Feb., 1882.

‡ KISSLING, 1882: *Zeitschr. anal. Chem., 21*, 64; Lyons's Pharmaceutical Assaying, p. 132. *Dragendorff's* "Werthbestimmung," page 55, paragraph 68. National Dispensatory, article Tabacum.

grams of it were then weighed, macerated with water acidulated with sulphuric acid for twenty-four hours, the expressed liquid and washings concentrated, filtered, and further concentrated with washings of the filter to 50 c. c. Of this portions of 10 c. c. were taken to obtain several agreeing titrations with Mayer's reagent. Of the latter, 1 c. c. was taken to equal 0.00405 gram of nicotine, as nearly supported by the eight estimations of Zinoffski cited by Dragendorff. In the assay of cigarettes, 5 grams were taken for the operation, and therefore each 10 c. c. represented 1 gram of the material. The results were as follows:

Brand of Cigarettes.	Mayer's Reagent for 1 gr. material.	Percentage of Nicotine.
Kinney Brother's "Full Dress."	2.7 c. c.	1.10
Kinney Brothers "Satin."	3.1 "	1.26
"Richmond Straight Cut."	3.4 "	1.38
"Old Judge"	3.8 "	1.54
"Temple Tar."	3.7 "	1.50
"Sweet Caporal."	4.0 "	1.62
"Virginia Bright."	4.2 "	1.70
"Duke's Cameo."	4.4 "	1.78
"Michigan Leaf Tobacco."	4.8 "	1.94
"New York Leaf Tobacco."	4.2 "	1.70
"Kentucky Leaf Tobacco."	4.6 "	1.86
"Richmond Gem Smoking."	3.9 "	1.58

Some estimations of the quantity of alkaloid remaining undecomposed in the smoke of cigarettes were made by drawing cigarette smoke through acidulated water. The proportion of alkaloid of the smoke so obtained, estimated as nicotine, was in the average a little over one half the total alkaloid found in the same cigarettes.

DISCUSSION.

PROF. PRESCOTT: Investigations have shown several times that a proportion of nicotine of the tobacco remains undecomposed when tobacco is smoked. So if tobacco smoke be drawn through acidulated water this undecomposed nicotine will be recovered again, in quite a considerable, though a variable portion. Of that portion of nico

tine which is decomposed some part is resolved into organic derivatives of nicotine, the physiological effects of which have never been determined, and other portions are decomposed into final harmless products. I was interested, however, in the statement made in a discussion upon a paper before the American Association for the Advancement of Science at Cleveland week before last. It was a statement made by Prof. Dudley, of Nashville, that he had analyzed the smoke of cigarettes regarding their proportion of carbon-monoxide, and he found it large, and he said that from a good deal of study of the subject he was disposed to attribute the especial injury from cigarette smoking to the inhalation of the smoke containing monoxide of carbon. Both cigarette smoke and cigar smoke, he said, contain carbon monoxide. But cigarette smokers inhale a much larger proportion of the smoke than do smokers of cigars and pipes, an important element in the effects of cigarette smoking.

An Index to Literature Upon the Synthesis of Ammonia.*

BY EZRA J. WARE,

SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

When ammonia is to be made synthetically one or both its elements must be taken in the nascent state. The various methods which I have consulted, and to which reference is made in the following index, may be grouped under three heads.

(1) The production of the nascent elements through

* The writer does not present this as a complete index to the contributions on this subject. It is even possible that some important papers may have been overlooked or not reached in his search.

the agency of heat, using water as the source of hydrogen and air as the source of nitrogen.

(2) The production of the nascent state by electricity, using free hydrogen and nitrogen.

(3) The natural methods, as by evaporation, porosity of arable soil, etc., using air and water as the materials.

None of the methods so far published seem fully to meet the demand for a good practicable commercial process. Marguerite and de Saurdeval's method seems as reasonable as any and upon it are based several others.

In no case has a quantitative estimation of the product been given, so we are quite unable to compare them by their results.

In 1872 a prize of 2,000 f. was offered in Paris for the fixation of the atmospheric nitrogen.

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cining a mixture of baryta and carbon in the air, barium cyanide is formed. This cyanide is decomposed in a current of steam at 300° C., liberating the whole of the nitrogen as ammonia.* *Comp. rend.*, *50*, 1100. *Phar. Jour.*, *2*, 129.

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The same, 1883.—"Process for the Preparation of Cyanogen Compounds and Ammonia." Based upon Mar-

*I tried an experiment to verify this method and believe I was partially successful. My time was short when I found this method and the apparatus was in use most of the time by others, therefore my operations were somewhat crude, as I did not do any check work. I took 9.5 grams of barium carbonate and 0.59 grams of charcoal, and pulverized in a mortar together. Introduced this mixture into an iron tube and kept it red hot for about an hour. I then passed steam through the hot tube and collected the result in standardized sulphuric acid. The result showed that the amount of acid neutralized was equal to the amount which would be neutralized by 0.13 grams of ammonia. The yield from another experiment was tested by passing the resulting gas into nesslerized solution, and there was obtained a heavy precipitate such as that produced by ammonia.

guerite and de Saurdeval's method. Mond however adds pitch (!) He makes bricks of a compound as follows: Barium carbonate, 32 parts; charcoal or coke, 8; pitch, 11 parts. These are subjected to a high heat in presence of nitrogen. Cyanides are formed which may easily be changed to ammonia. *Dingl. poly. Jour.*, *248*, 366. *Jour. Soc. Chem. Ind.*, *2*, 328.

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used, the latter to combine with the ammonia. *Jour. Soc. Chem. Ind.*, *1*, 150. *Jahresb. Chem. Tech.*, 1882, 287.

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DISCUSSION.

PROF. PRESCOTT: This is sometimes classed as manufacturing chemistry and is certainly cognate with pharmaceutical chemistry. Every year brings greater and greater demand for the production of ammonia, so it almost seems as though the life sustaining power of this planet must depend in no small degree on the question of resolving atmospheric nitrogen into ammonia in some economical way.

MR. EBERBACH: I have been for sometime interested in the manufacture of ammonia in connection with the Michigan Ammonia Works, but the reading and researches that I have made have never branched out in the direction of using nitrogen and forming combinations by any of the processes suggested. Our whole attention so far has been directed to the natural resources we have in the shape of gas water and other ammoniacal liquors, and I must confess that the subject of this paper has very much interested me, and I will make it a point to follow up the suggestions, more because the sources of our raw material are getting somewhat scarce, so much so that attention has already been drawn to the propriety of utilizing the large coal fields of Pennsylvania for the ammonia that has been wasted there. It certainly is a subject of very great importance and has promises of a very remunerative future.

PROF. PRESCOTT: Has not Dr. Duffield a word to say upon this subject?

DR. DUFFIELD: I feel, myself, somewhat aged as regards ammonia. The processes that were pursued many years ago in the manufacture of ammonia were the processes suggested by Dr. Swift and Dr. Diehl, of Louisville.

I have also investigated the subject of the manufacture of soda by ammonia and am somewhat familiar with the process by which atmospheric ammonia may be formed.

PROF. PRESCOTT: Tell us about it.

DR. DUFFIELD: The process is not of much value, from the fact it is too costly, and from the great difficulty that has been met with as to the conversion of all of the nitrogen or much of the nitrogen into ammonia. It has been proven that a certain amount of ammonia can be made beyond a doubt, but the cost of converting the nitrogen into ammonia is too great to warrant its manufacture on a large scale. If we could get a system by which we could condense matters as they do with platinum, we might utilize all the nitrogen, but as yet it is an ultima thule to which we will look but to which we have not attained.

I saw experiments also made by a student with Dragendorff to see how much could be done in that line, but the moment that you come to manufacture on a large scale the difficulties that stand in the way are enormous. The results of this young man's experiment were that his last hope seemed to be centered in the effects of the electric current.

Antipyrine.

BY CHARLES W. ALLISON, SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

Antipyrine which is now so largely used as antipyretic, was discovered and patented in 1884, by Dr. Ludwig Knorr, of the University of Erlangen. Its chemical name is Dimethyl-oxy-quinizine, the word "Antipyrine" being simply the commercial name. At first the method of manufacture was kept a secret, but a few months later Dr. Knorr published a paper which threw some light on the subject. The method is as follows:

Twenty parts of aniline are dissolved in 50 parts of Hydrochloric acid of sp. gr. 1.19 and 80 parts of water, and to this solution enough sodium nitrite, dissolved in twice its weight of water acidulated with Hydrochloric acid, is added to convert the aniline into diazobenzolchloride, the reaction being represented by the following equation:

$$C_6H_5NH_2+HNO_2+HCl=C_6H_5N_2Cl+2\ H_2O$$

aniline. nitrous acid. hydrochloric acid. diazobenzol chloride. water.

The solution thus obtained is poured in an ice-cold saturated solution of sodium sulphite, and as soon as the separated crystals dissolve in the supernatant liquid without the elimination of a gas, the whole is cautiously warmed on the water-bath, so as to dissolve the most of the separated salt. The mixture is now carefully neutralized with hydrochloric acid. Next it is acidulated with acetic acid, and mixed with dust zinc until the liquid has become colorless. The liquid is now filtered, heated to boiling, and mixed with about one-third its volume of fuming hydrochloric acid, when the product, the hydrochlorate of phenylhydrazine is decomposed with a solution of soda. Most of the hydrazine is hereby separated as an oil; the remainder being shaken out with ether. The crude hydrazine is dehydrated with corbonate of potassium, and then rectified. It is a slightly aromatic oil, of sp. gr. 1.091, very resisting towards reducing agents, but easily destroyed by oxidizing agents.

The next step is the preparation of ethyl-diacetic acid. $C_6H_{10}O_2$.

One hundred parts of metallic sodium in small pieces are added to 1000 parts of *pure* acetic ether. As soon as the mixture ceases to become warm it is gently warmed on the water-bath, under an upright condenser, until the sodium is all dissolved. To the still warm liquid 550 parts of acetic acid are added, and after cooling, 500 parts of

water are added, and the whole shaken, and the upper layer removed. This is washed with a little distilled water, and then distilled first on the water-bath and then over an open flame. The several portions between 100°—130°, 130°—165°, 165°—175°, 175°—185°, 185°—200° are caught separately and the fractional distillation repeated three times, so as to separate all portions boiling between 175°—185°, of which about 175 parts are obtained.

The phenylhydrazine and the ethyl-diacetic acid are mixed in proportion to their molecular weights and heated to 100° C, when *methyl-oxy-chinizin* is formed according to the following equation:

$$C_6H_5N_2H_3 + C_6H_{10}O_3 = C_{10}H_{10}NO + H_2O + C_6H_6O$$

phenylhydrazine. ethyl diacetic acid. methyl-oxy chinizin.

The methyl-oxy-chinizin thus formed has both acid and basic properties. It still contains an atom of hydrogen, which is easily replaced by an alcohol radical. This may be effected in two ways, (1) by heating with an excess of phenylhydrazine to 170° or (2) by heating in a sealed tube with equal part of methyl iodide and methyl alcohol. In both cases the resulting product is dimethyl-oxy-chinizin or "antipyrine."

Antipyrine is furnished in two forms, crystalline and granular, the granular being the more common. The crystalline product is found in colorless, prismatic crystals, or a white crystalline powder. (German Pharmacopœia Commission.)

It has a mild bitter taste, and a barely perceptible odor.

It is soluble in less than one part of cold water, and in nearly any proportion of hot water. Freely soluble in alcohol, chloroform and in about fifty parts of ether.

The general qualitative reagents for alkaloids give precipitates with antipyrine in slightly acidulated solutions. Potassium mercuric iodide, or Mayer's solution, precipitates antipyrine, white, in solutions of 1 part to 7000. Sol-

ution must be nearly free from alcohol. Iodine in potassium iodide gives a reddish-yellow precipitate in solutions of 1 to 5000. Phosphomolybdic acid throws down a yellowish-white precipitate in solutions of 1 to 40000. Picric acid in acidulated solution gives a lemon-yellow precipitate. The precipitation is aided by agitation. Limit 1 to 2000. From dilute solutions the precipitate is crystalline. Platinic chloride gives an orange colored precipitate, and gold chloride a precipitate of yellowish color. Potassium cadmium iodide and potassium bismuth iodide also give precipitates.*

Ferric chloride in solutions of 1 to 1000 gives an intense red color. "A light brown color in solutions of 1 to 100,000, and a yellow color when diluted as far as 1 to 500,000." † Nitrous acid as obtained by adding a small piece of nitrite of potassium or sodium and acidulating gives in concentrated solutions, a green crystalline precipitate, and in dilute solutions a blueish-green color visible in solutions of 1 to 100,000. "Two drops of fuming nitric acid added to 2 c. c. of 1% solution of antipyrine causes a green color, and, after heating to boiling, another drop of the reagent gives a red color" (Germ. Ph. Commission.) Dilute bromine or chlorine water gives a yellowish-white precipitate.

If to the dry residue on a white porcelain surface 2 or 3 drops of nitric acid be added, and then a few drops of sulphuric acid, there is obtained a greenish-yellow color which changes to a blood red, which changes to a deep violet color upon diluting. The same test may be applied to the solution as follows: To 1 c. c., 2 or 3 drops of nitric acid are added, then sulphuric acid is added drop by drop in excess, when a cherry-red color is produced. An excess of the sulphuric acid must be avoided. When antipyrine is dissolved in a few drops of nitric acid, and heated it

* Edmund Blumenbach, *Am. Drugg.*, 1887, p. 168.
† Ibid.

gives a deep violet color. Fuming nitric acid applied to the dry residue produces first a yellowish-green color which rapidly changes into a deep red color and, on heating, to a deep purple. The green precipitate produced when spirit of nitrous ether is added, and which has caused pharmacists so much trouble, is iso-nitroso-antipyrine $C_{11}H_{11}N_3O_2$. *

"When in solution with other substances, antipyrine may be separated by acidulating and shaking out with petroleum ether, to remove fats, then making alkaline with ammonia, and extracting with chloroform." †

Antipyrine is best administered in solution with a flavoring ingredient, or a wine. When given with wine it must be freshly dissolved, as on standing a precipitate occurs. ‡

DISCUSSION.

PROF. PRESCOTT: With regard to the pronunciation of the word Antipyrine I am very glad to be corrected, although I do not know that the pronunciation of this word has been definitely settled. I have been in a great deal of uncertainty about a great many chemical words, but I was a little consoled in my uncertainty at the meeting of the American Association for the Advancement of Science week before last, where a committee was constituted to obtain if possible an agreement from American chemists upon the pronunciation of certain representative chemical words, and before that committee were brought certain inquiries by the revisors of Webster's dictionary. They said, "We want to know how you chemists pronounce the word, and we shall give your pronunciation in the dictionary." It was stated on the part of the representative of Webster's dictionary that in the edition now about to go to press nearly all words ending in "ine" will have given these two

* DR. KNORR, 1888.

† EDMUND BLUMENBACH, *Am. Drugg.*, 1887, p. 168.

‡ K. REBER, *Am. Drugg.*, 1884, p. 228.

pronunciations, with the preference thus: "Chlorin and chlorine" the preference being given to the short vowel sound. Of course the German pronunciation very much affects our chemical scientific speech, from the fact that so many of our native born chemists are educated in the German pronunciation, and in so many cases German is translated into English without alteration.

Color Reaction of Aniline Dyes upon Essential Oils.

BY JOHN D. RIKER, UNIVERSITY OF MICHIGAN.

While at work on the oils of tansy and pennyroyal the writer's attention was called to their peculiar behavior with aniline dyes, and the thought came to him that the dyes might have some very interesting relations to the volatile oils; hence the following tests were carried on and applied as follows:

Ten to fifteen drops of the oil to be tested was placed in a small (0.5 inch diameter) test tube; then one to three drops of an aniline dye solution added and the changes noted in the cold as well as after heating.

Below are given the results of careful observations, using oils obtained from retail drug stores in Ann Arbor, with no definite proof of their purity.

As soon as a list of unquestionable pure oils can be obtained the writer will endeavor to verify these results.

The dyes used were common commercial dyes obtainable at any drug store.

All the dye solutions were made by taking 0.5 gram of the powdered dye and dissolving in 25 c. c. of distilled water.

Experiments with Magenta solution: 1–3 drops of the dye solution were added to 10 to 15 drops of the oil with the following results:

Cassia oil takes up scarlet red color in cold; heating turns bright red; on cooling again turns scarlet.

The oil of cloves absorbs red in cold; on heating all color disappears.

Absorbing red in cold; no change on heating, oils of

Caraway,	Pimenta,
Croton,	Tansy,
Peppermint,	Wintergreen.

Mustard oil absorbs red in cold; heating all color disappears, leaving the oil milk white.

Pennyroyal takes up scarlet red in cold; on heating turns a deep ruby red.

Magneta not absorbed with oils of

Anise,	Eucalyptus,	Lemon,	Savine,
Amber,	Fire Weed,	Orange,	Wormwood,
Bergamot,	Hemlock,	Origanum,	
Cedar Red,	Juniper Wood,	Sassafras.	

Experiments with Berlin blue solution:

Absorbing blue in cold; no change on heating; oils of

Cloves,	Mustard
Caraway,	Pennyroyal,
Croton,	Tansy.

Turning deep cherry red in cold; no change on heating; oils of

Anise,	Hemlock,
Fire Weed,	Sassafras.

Savine oil takes up purple in cold; on heating turns ruby red.

Cassia oil turns green color in cold; no change on heating.

Juniper wood and Eucalyptus oils show a play of colors. The blue solution turns purple, then colorless while the oils take a brown color; heating hastens the disappearance of the blue color of the solution and leaves the oil a golden yellow color.

Wintergreen and Pepperment oils absorb blue in cold; heating slightly, turns violet; heating to boil, turns a deep cherry red; on cooling gradually, turns from cherry red to purple, then blue.

Berlin blue not absorbed with oils of

Amber,	Lemon,
Cedar Red,	Orange,
Bergamot,	Origanum.

Experiments with Hoffman's violet solution:

Absorbing violet in cold; no change on heating; oils of

Clove,	Croton,	Pennyroyal,	Sassafras,
Caraway,	Lemon,	Pepperment,	Wintergreen,
	Origanum,	Savine.	

Absorbing violet in cold; color disappears on heating; oils of

Anise,	Fire Weed,
Bergamot,	Orange,
Cedar Red,	Tansy.

Amber oil absorbs violet in cold; heating turns deep cherry red.

Caraway oil turns scarlet red in cold; heating no change.

Cassia and Mustard oils turn blue in cold; heating no change.

Pimenta oil turns dark ruby red in cold; heating no change.

Hoffman's violet solution not absorbed with oils of Eucalyptus, Hemlock or Juniper. [Note.—Gentian violet dye gives nearly same results.]

Experiments with Methyl green solution:

Absorbing various shades of green in cold; heating no change; oils of

Cassia,	Mustard,
Croton,	Pennyroyal,
Caraway,	Tansy.

Absorbing green in cold; color disappearing on heating; oils of

Anise,	Pimenta,
Fire Weed,	Cloves.

Amber oil will not absorb methyl green in cold but on heating takes a grass green color, and the methyl green solution becomes blue.

Pepperment oil, no absorbtion in cold, on heating takes up the green color.

Wintergreen absorbs grass green color readily in cold and the methyl green solution turns blue; no change on heating.

Methyl green not absorbed with oils of

Cedar Red,	Juniper Wood,	Orange,	Savine,
Bergamot,	Lemon,	Origanum,	Wormwood,
Eucalyptus,	Hemlock,	Sassafras,	Spike.

Absorbing Nigrosin coloring in cold; no change on heating; oils of

Cloves,	Eucalyptus,	Wintergreen,
Cassia,	Pimenta.	
Caraway,	Pennyroyal.	

Not absorbing Nigrosin in cold but taking up readily on heating; oils of

Amber,	Sassafras.
Anise,	Tansy.

Absorbing Nigrosin Comp., but slightly in cold; no change on heating; oils of Mustard, Pepperment and Orange.

Nigrosin solution not absorbed with oils of

Bergamot,	Fire Weed,	Lemon,
Cedar Red,	Hemlock,	Origanum,
Croton,	Juniper Wood.	

Experiments with Aniline blue solution:

Absorbing blue in cold; no change on heating; oils of

Cloves,	Cassia,	Pennyroyal,
Caraway,		Pimenta.

Mustard oil absorbs blue in cold, heating fades or blanches until all color disappears.

Peppermint oil no absorbtion in cold but absorbs blue color slightly on heating.

Sassafras oil, no absorbtion in cold; heating blanches the blue solution.

Analine blue not absorbed with; oils of

Anise,	Eucalyptus,	Orange,
Amber,	Fire Weed,	Origanum,
Croton,	Hemlock,	Savine,
Cedar Red,	Juniper Wood,	Tansy,
Bergamot,	Lemon,	Wintergreen.

The above results would seem to indicate that further investigation in this direction might prove fruitful of reliable qualitative tests for many of the essential oils.

Adulteration of Powdered and Ground Slippery Elm Bark.

BY JAMES A. CALDWELL, DETROIT.

It may not be generally known to the pharmacist, but nevertheless it is a fact that a great deal of the ground and powdered slippery elm bark found in the market is adulterated to a shameful extent, so much so that in some samples the bark is hard to discern. Having purchased a supply a short time ago my attention was drawn to the appearance, first to the size of the package, a ten pound lot of the ground article not looking larger than five should, but upon weighing it was found to be full weight. My suspicion being aroused I pursued my investigation further. Taking a sample from the package I noticed first a peculiar odor resembling wheat flour, but the taste lead me to think of another article, viz., "middlings" or "shorts" as sometimes called. So placing a sample under the microscope and comparing with an article which I powdered

from the true bark I could see a marked difference, but I must confess that I would have to study a long time before I could tell which of the two was the true bark, so I dropped that method, and returned to the sense of taste and smell, as being in this case a quite trustworthy test. When the article was subjected to incineration anyone familiar with the odor of burnt bread could recognize at once that flour or something ground from wheat was present. I next tried the iodine test for starch, putting a few grains of the ground bark in a test tube with a little water and boiling for few minutes than adding a little iodine the characteristic blue iodide of starch appeared in abundance. Now there is no doubt in my mind but what this adulteration is carried on to a considerable extent, and it is safe to say that at least fifty per cent. of this article is nothing more or less than "middlings." Now the use of middlings as an adulterant may or may not be injurious, but be that as it may the pharmacist and his customer should get what they pay for. If we want slippery elm we pay 20 cents per pound. Two cents a pound would be a high price for shorts, but the worst of such a substitution is that you get what is not wanted at any price.

The Quality of Medicinal Benzoic Acid.

BY JOSEPH B. WHINERY,

SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

There are three sources from which medicinal benzoic acid is principally obtained. First, from gum benzoin, either by sublimation or by boiling the benzoin with calcium hydrate, precipitating with hydrochloric acid, and then subliming in order to obtain the acid in the usually recognized form. Second, from hippuric acid, the urine is concentrated, hydrochloric acid is added, and impure hip-

puric acid is deposited. This is dissolved in boiling water, heated with chlorine to decolorize and again crystallized. It is converted into the sodium salt, precipitated by an acid and sublimed. A third source of benzoic acid, and by no means the least important, is from toluene. Toluene is converted successively into the monodi, and trichloromethylbenzenes, and from the last named benzoic acid is obtained.

The acid from these three sources is known in commerce under two heads, namely, English and German. We understand by the name "English" the acid obtained from benzoin, and by the name "German" the artificial acid from any source.

It is a recognized fact that the acid from benzoin is medicinally the best, if not always the purest in a chemical sense, and is the acid recognized by the U. S. Pharmacopœia. This authority has been construed to imply that the acid must be made from benzoin by extraction with lime, because the acid is to be in "white, lustrous scales, or friable needles," and have "a slight aromatic odor of benzoin." These terms of description, not given with minuteness nor in the place of requirements, hardly justify the construction referred to. It seems to me that an acid sold as the English acid may or may not be from gum benzoin, since an artificial acid may be sublimed with a small portion of the true acid, possess the aromatic odor, and correspond to all the other tests of the Pharmacopœia.

The analysis of two samples of the acid purchased as the English showed them to be comparatively free from impurities, and to fulfil the requirements of the Pharmacopœia. But is the English acid used and sold as a rule by dispensing pharmacists? I think not, on the contrary it seems that the German acid is used and sold quite generally by retail druggists. On specific inquiry for answer to the question just stated I find that the German acid is

the kind usually called for by the retail drug trade. One wholesale firm writes, "we sell on an average at least two pounds of German to one ounce of the English acid, and it follows that the greater portion of the acid used in medicinal preparations is not the true sublimed or precipitated acid from gum benzoin, but the synthetical acid from some other source.

What is the source of this synthetical acid? Is it from hippuric acid or is it from toluol? I find it stated by Prof. P. W. Bedford in the proceedings of the American Pharmaceutical Association for 1880, (page 384), in a reply to a query, that the largest demand was then for the acid made from hippuric acid. But judging from present inability to procure much of this acid, its use medicinally is narrowly limited. In fact its cost is now just double the cost of the acid from toluol. I found on analysis of a sample from hippuric acid that it contained a smaller proportion of impurities than considerable of the article made from toluol. The use of German acid from toluol, to such a great extent, is evidently due to its much lower cost, a strong argument in its favor with too many dealers. This article can be purchased for one third the price of the acid from benzoin. It is remarked in Dr. Prescott's "Organic Aanalysis" (page 66), that there may be two reasons for requiring medicinal benzoic acid to be sublimed from the gum. First, the essential oil of benzoin obtained with the sublimed acid has a stimulant effect and an agreeable odor; second, by outlawing the artificial product the injurious impurities frequently present in it may be avoided. According to the method of manufacture, intimated by the Pharmacopœia, the essential oil cannot be present to any great extent, and there seems to be no other objection if the acid is pure. But the German acid as it is found is far from pure. It is stated on the same page of Dr. Prescott's book "that a chemical pure acid has not been manufactured on a com-

mercial scale from any source, and the statement certainly holds good in every case, a considerable quantity of the German variety contains impurities to an injurious extent.

The most common impurity is chlorobenzoic acid. This product which occurs as the last step before conversion into benzoic acid I found present in nearly all samples of the German acid examined and in two cases to the extent of 6% and over. The Pharmacopœial test for this impurity is by heating a small quantity of the acid on some recently ignited and moistened cupric oxide held in a loop of platinum wire and introduced into a non-luminous flame, there should be no green or bluish green color to the flame; absence of chlorobenzoic acid. Care should be taken that the heat is not too high as the acid and the oxide alone will sometimes give the green flame. All of the artificial samples subjected to this test gave the green flame, the time of lasting varying with the amount of impurity which the sample contained. Another good test for chloro-toluenes is given in Dr. Prescott's "Organic Analysis," page 69, and is as follows: Slowly heat a portion of the acid under solid potassium or sodium hydrate, "free from chlorine," on platinum foil, dissolve the mass in water, filter if necessary, acidulate with nitric acid, and test with silver nitrate solution for a chloride, the addition of silver nitrate should not produce more than a slight turbidity.

Cinnamic acid nor organic impurities were found present in either the English or the German samples analyzed. Below is the result of the analysis of eleven samples of the acid with regard to purity:

	1	2	3	4	5	6	7	8	9	10	11
	Toluol Variety.	English.	Toluol Variety.	Toluol Variety.	Toluol Variety.	English.	Toluol Variety.	Toluol Variety.	Toluol Variety.	From Urine.	Toluol Variety.
Solution of Acid in Cold H_2SO_4 on Heating.	Light Brown Color.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.
Heated with CNO.	Green Color.	None.	Green Color.	Slight Trace.	Green Color.	Slight Trace.	Green Color.	Green Color.	Green Color.	Green Color.	Green Color.
Triturated with $KMNO_4$	No odor of Bitter Almonds.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.
Chlorides (free).	Trace.	Trace.	Trace.	Trace.	Trace.	Slight Trace.	Very Slight Trace.	Very Slight Trace.	Slight Trace.	Trace.	Slight Trace.
Sulphates.	None.	None.	None.	Slight Trace.	Very Slight Trace.	Very Slight Trace.	Very Slight Trace.	Trace.	Very Slight Trace.	Trace.	None.
Odor.	Faint Aromatic.	Aromatic.	Faint Aromatic.	Faint Aromatic.	Faint Aromatic.	Aromatic.	Faint Aromatic.	Faint Aromatic.	Faint Aromatic.	Odorless.	Faint Aromatic.
Per Cent. of Trichlorotoluenes.	6.35 p. c.	None.	3.37 p. c.	Trace.	1.27 p. c.	Trace.	3.37 p. c.	1.69 p. c.	2.54 p. c.	1.69 p. c.	6.35 p. c.

The above samples were obtained from both wholesale and retail drug stores, covering a wide range of territory.

It is my conclusion that the greater portion of the acid in use at present is of an impure nature, and does not meet the requirements of the Pharmacopœia. And I see no reason why the German acid so long as it is used almost universally cannot be obtained in a comparatively pure state. As it would only require a little more care on the part of the manufacturer.

DISCUSSION.

MR. GUNDRUM: The German acid is flavored with almond oil.

PROF. PRESCOTT: Yes, it carries it incidentally. It is not added by any means, it is incidentally present and the object of the manufacturer is to avoid it if he can, but he cannot do so without much labor. The almond oil is really produced along with the benzoic acid, in very small quantities to be sure, but still enough to give a strong odor.

There is a very marked difference in the price of "German" and "English" articles, so there is a great temptation for substitution.

MR. GUNDRUM: By subliming the two together the German could be passed for English.

PROF. PRESCOTT: A poor quality of the artificial acid, free from almond odor, sublimed with a small quantity of benzoin gum, could with difficulty be distinguished from the natural acid. But the Pharmacopœal test for chlorine would be likely to reveal the German acid.

Methods of Separating the Constituents of Jalap.

BY CHALMERS P. ALLEN,

SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

It is certainly desirable to have a better method for the preparation of the officinal resin of jalap than that of the Pharmacopœia, which is the method used for resins in general, namely: Extracting with alcohol and precipitating the tincture with water. The trouble commences after evaporating the alcohol. The Pharmacopœia directs to distil off the alcohol until the tincture is reduced to 40 parts, 100 parts of the drug having been taken. The extract is then to be poured into 900 parts of water. When reduced to 40 parts the concentrated liquid has become very thick, nearly solid, and the water is not likely to dissolve all the coloring matter. On the other hand if the tincture be only evaporated to 75 parts, and then mixed with water, the result will be a mixture somewhat of the appearance of a poorly made emulsion, an appearance due to an oily looking, flesh colored precipitate, that seems to be held in suspension. An attempt to separate by filtering proved fruitless, everything going through the filter, either single or double. The mixture was allowed to stand, and not until the third day was there any sign of separation.

Different ways of separating the resin were tried. (1) The resin was precipitated from the tincture by adding a saturated solution of potash alum, but this tended to dissolve rather than to precipitate the resin. (2) It was undertaken to first extract the drug with water, then dry it, and extract it with alcohol, in the hope that when the alcoholic extract should be evaporated the resin would be obtained. My first difficulty appeared very soon. The water would not percolate the drug. Resorting then to maceration of the powdered drug in water, I was unable

afterward to filter out the powder, and when pressed in linen the expressed liquid was still too heavily turbid to be filtered clear by use of any filtering medium to be found. With a growing doubt of the practicability of extracting the water-soluble matter before the removal of the resins, this attempt was abandoned.

In further experimentation, instead of exhausting the drug as directed by the U. S. Ph., a Soxhlet's extraction apparatus was used, as a more efficient method for quantitative work. After exhausting the drug in this way with alcohol, drying and weighing, it was found to have lost between 22 and 23% of its weight. From the solution between 9 and 10% officinal resin was obtained, this total of resins being composed, as is well known, of two principles: Jalapin and Convolvulin. Jalapin is soluble in ether, convolvulin is insoluble in ether. This solvent affords an easy separation of the two resins, as follows: The resins were mixed with three times their bulk of sand, previously cleaned, the mixture was placed in a Soxhlet's apparatus, and extracted with ether. When the extraction was complete, the powder was taken out of the Soxhlet's tube, and was freed from ether by subjecting it to a gentle heat, then the powder was repacked in the tube and extracted with alcohol. On evaporating the ethereal extract the jalapin was obtained as a soft resin of a dark red color. The alcoholic extract, obtained after that by ether, on being evaporated yielded the convolvulin, a hard resin, very brittle. From different experiments I found that the officinal resin contained between 8 and 9 times as much convolvulin as jalapin.

Taking 25 grams of powdered jalap, and treating as before stated to obtain the total resins, the weight of these was 2.265 grams or 9.06% of the jalap. In separating the two resins 0.229 grams of jalapin, and 1.963 grams of convolvulin, were obtained, with loss of only 0.073 grams in the operation.

Some experiments with various reagents were made upon the two resins, as well as some trials of their solubility. Both the resins were found to be soluble in sulphuric acid, the solutions in both cases being red, convolvulin giving off a very disagreeable musty odor. With hydrochloric acid there did not appear to be much action until heat was applied, when both resins readily dissolved. Potassium hydrate readily dissolved both resins. A weighed portion of the total resins, taken after exposure to air for some time, when dried on a watch glass at 100°C, for 1½ hours, lost 3.6 per cent. of its weight, the proportion of moisture retained and taken from the air.

Analysis of Lobelia Inflata.

BY D. P. HORINE, SCHOOL OF PHARMACY UNIVERSITY OF MICHIGAN.

Some work has already been done upon this subject, and the main work here presented has been to separate the different constituents of the plant. The plan of work followed was that given by Loyd Bros. in their "Drugs and Medicines of North America." The volatile oil of lobelia exists in the plant in very small quantity, and from four ounces of seed only a few drops of the oil were obtained. The volatile oil has a very penetrating and unpleasant odor, and it is to this that the odor of the plant is partly due. This oil is of a clear water color. It was obtained by forcing steam through the powder packed in a percolator, and by dissolving it from the water by means of ether. The fixed oil of lobelia was obtained by treating the powdered seed with benzine after extracting the volatile oil. This fixed oil is of a dark color somewhat resembling crude petroleum, but is not so decided. The amount of fixed oil from the *seed* of lobelia was about twenty-seven and one-half per cent., while the amount from the herb

itself was not more than four and a half per cent. After extracting the oil with benzine, this solvent was driven off on the steam bath. The alkaloids of lobelia, inflatin and lobelin, are very instable and very easily broken up into other compounds. The effect of heat was tried upon these principles, and it was found that, even in dilute acid solutions, decomposition took place to quite an extent when they were heated. The powdered drug was treated for extraction of the volatile oil by passing steam through it for three hours, and then for extraction of the fixed oil with benzine, when it was percolated with a menstruum consisting of alcohol twenty parts, and acetic acid one part, until the drug was exhausted. This tincture contained the alkaloids in much smaller quantity than the same seed when not subjected to heat. To obtain the alkaloids, moisten the drug with a menstruum of alcohol ten parts, and acetic acid one part, and macerate twenty-four hours, then percolate and exhaust with a mixture of alcohol twenty parts and acetic acid one part. This tincture is concentrated at a very low heat to a thick syrup, then water is added to the consistence of thin syrup. To this solution add ether, and then cautiously add ammonia to a slight alkaline reaction, and separate the ethereal layer by means of a separatory funnel. The ethereal layer is then to be decanted, and evaporated in the presence of water that has been previously acidulated with acetic acid. Repeat these operations until a perfectly colorless solution results from which the alkaloids are to be obtained. The clear solution is evaporated and treated with carbon disulphide. This extracts the Inflatin. Lobelin is soluble in alcohol, chloroform, and ether. It is slightly soluble in benzin and carbon disulphide.

Antifebrin or Acetanilid.

BY SAMUEL KIDDER, JR.,

SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

Antifebrin has been the commercial name given to the chemical compound phenylacetanide, $C_6H_5NH\ C_2H_3O$, now well known and largely sold under its proper name, acetanilid. It is by no means a new discovery, having been prepared by Gerhardt in 1852,* but its medicinal properties were only discovered about two years ago by Messrs. Cahn and Hepp of Germany. It is a white, crystalline, odorless powder, having a slight burning taste. It is said to have neither basic nor acid properties, although it forms a hydrochloride, $C_6H_5NH\ (C_2H_3O)\ HCl$,† which is a very unstable body, immediately decomposed on being brought in contact with water. It also forms by displacement of the last atom of hydrogen, salts with sodium and mercury, as follows:—$C_6H_5N\ Na(C_2H_3O)$ and $(C_6H_5N)_2\ Hg(C_2H_3O)_2$.

When heated to 101°C. in a sulphuric acid bath, as directed by Remsen for observing melting points, I observed it to melt, this being the melting point given by some recent writers,‡ is the same while other authorities‖ give 112°C. Whether the difference in the melting point is due to some foreign substance or not, the writer is, at present unable to say. The boiling point of acetanilid is generally given as 295°C., at which temperature it distils

* Liebig's *Annalen 81*, 64; *87*, 164.

† Roscoe & Schorlemmer *3*, [3], 210 and 211.

‡ Proc. Am. Phar. Assoc., *35*, 351.

‖ WILLIAMS, *Jour. Chem. Soc.*, *2*, 106. Watts's Dict., *5*, 1087. Roscoe and Schorlemmer. Watt's Dict., *4*, 418. Richter's Organic Chemistry.

unchanged. If heated with zinc chloride to 270°C., flavaniline is formed, having the composition of $C_{16}H_{14}N_2$ and being a derivative of quinoline.

The solubility of acetanilid was as follows:

	At 15°C.	At Boiling Point.
Water,	200 pts.	20 pts.
Alcohol,	4 "	2 "
Ether,	16 "	13 "
Chloroform,	6 "	2 "
Benzene,	96 "	2 "

It also dissolves in strong acids but is precipitated from their solutions by the addition of water. It is soluble in most of the volatile oils, crystallyzing from lemon oil in beautiful needles. It is also soluble in alcoholic liquors, in which latter solutions it is often prescribed. The aromatic spirits of ammonia is highly recommended as a solvent and vehicle for its administration in cases where it is to be used as a febrifuge.

Acetanilid may be conveniently manufactured on the small scale by the following process:*—372 grams of the purest aniline, and 240 grams of glacial acetic acid, are heated to boiling in a flask provided with a return condenser, for four hours, when the excess of both ingredients is distilled off, with the aid of a sand bath, until the temperature rises to 260°C., when the distillation is stopped and the cooled, congealed residue is found to be crude acetanilid or "antifebrin." It may be purified by sublimation or by repeated crystallization from boiling water or benzene; the sublimed product having a whiter and lighter appearance than the crystallized product. The latter has somewhat the appearance of boric acid, but is likely to be the purer product. The yield of this operation, with the quantities above given, should be about 400 grams. The reaction is represented by the equation:

* *Proc. Am. Phar. Assoc. 35*, 351 and 352.

$$C_6H_5NH_2 + C_2H_3O(OH) = C_6H_5NH(C_2H_3O) + H_2O$$

Aniline. Acetic Acid. Acetanilid. Water.

Of qualitative reactions given in literature the following were verified: Pour 2 or 3 drops of mercuric nitrate upon a few milligrams of acetanilid, warm gently, and add 2 or 3 drops of sulphuric acid, when a blood-red color is obtained. One milligram of acetanilid is said to give this test.* The same reaction, in appearance, is obtained with resorcin, phenol, and thymol, and with tannic, gallic, benzoic, and salicylic acids. The nitric reaction may be applied by adding a very little mercuric nitrate alone and heating, when the mass assumes a vivid green color. This is a very delicate test and is used in detecting acetanilid from the urine: the urine being shaken with chloroform and the choloform solution evaporated and its residue tested.

When ferric chloride is added to a hot, aqueous solution of acetanilid, a red color is obtained; the color, I found to be rather of a dull red and not produced at all in the cold. If one gram of acetanilid be treated with 1 c. c. of hydrochloric acid and heat applied until a clear solution is obtained, 3 c. c. of water be added, and then 1 drop of melted carbolic acid, followed by a few drops of a solution of chlorinated lime (1 in 10), an onion-red color will be obtained. Upon supersaturating this solution with ammonia an indigo-blue color is produced. I found the color upon supersaturating with ammonia to be very dark indigo-blue.

If 2 parts of acetanilid be triturated with one part of fused potassium hydrate, and enough chloroform added to moisten the mass, and the mixture then *very gently* warmed, the characteristic and unmistakable odor of isocyanphenyl, or carbylamine, C_6H_5NC, is perceived. This test is deli-

* *Amer. Drugg.*, 1886, 209.

cate and characteristic. If a small portion of acetanilid be dissolved in a little sulphuric acid, with the aid of heat, and, when the liquid is cold again, 2 or 3 drops are poured down the side of a test tube nearly filled with chlorine water, a deep, violet color appears in the lower part of the test tube, while the upper part is deep red.

Potassium hydrate decomposes acetanilid, forming aniline and acetate of potassium. Fuming nitric acid forms nitrophenyl-acetanide. Acetanilid gives no reaction, in the cold, with ferric chloride, potassium dichromate, or nitrous acid, each of which reagents gives a distinct reaction with antipyrine, kairnie and other antipyretics.

The following reactions, made the subject of expriment, the writer did not find any literature upon:

To a moderately concentrated alcoholic solution of acetanilid there was added a few drops of a neutral solution of permanganate of potassium. The permanganate was gradually reduced to the manganate, the solution taking a decided green color. By cooling the test-tube under the hydrant for a few moments, a voluminous precipitate formed and soon solidified into a gelatinous mass, solid enough to maintain itself in the test-tube when inverted. The test applied in the same way to a solution of the permanganate made strongly alkaline with potash gave nearly the same results, except that the reduction was slower and the precipitate did not solidify. But when the permanganate was made strongly acidulous with the sulphuric acid, the permanganate was at once reduced to the dyad state, and a red precipitate appeared. Stannous chloride had no effect; neither had nascent hydrogen; nor the other common reducing agents. These tests would seem to indicate acetanilid to be a reducing agent of some capacity.

The following tests we applied precisely as if testing for an alkaloid in the dry way, that is, by touching the end of a glass rod, moistened with the reagent, to a film of the dried

substance upon a white porcelain surface. Sulphuric acid had no action. Nitric acid had no reaction. The mixture of these two acids gave no action in the cold, but gave yellow color upon warming. Sulphuric acid and potassium dichromate, applied as in the fading purple test for stychnine, gave a *fading red*, the color appearing *very distinctly*, for only a moment, fading quickly to blue, and then quickly and completely disappearing. I found 0.00033 gram of acetanilid to give this reaction distinctly. When manganese dioxide was substituted for the dichromate a red color was obtained, which lasted for a few moments and then completely disappeared. This last test is not the same given by berberine, inasmuch as the color produced by berberine is permanent, or, at least, lasts for a considerable length of time.

Vitellis' atropine test is inapplicable to acetanilid, as the fuming nitric acid converts the acetanilid into nitrophenyl-acetanilid, a brownish body, as before stated.

The only impurity that is especially liable to occur in this drug, certianly if the articles from which it is made be pure, is that of aniline, slight traces of which should condemn the drug for medicinal use. The following test is given for its detection: * Triturate an excess of acetanilid with water to make a mixture, and add a solution of sodium hypobromite; if the product is pure the solution will remain yellow and limpid; but if it contains the slightest traces of aniline, a plentiful orange-red precepitate will be formed, the liquid assuming the same color. The only means of a quantitative estimation that I found is the following: † Nitrous anhydride is passed into a cooled solution of acetanilid in glacial acetic acid, and the green solution thus obtained is poured into cold water, when a yellow body,

* *Phar. Jour. Trans.*, [3], *17*, 685.

† *Jour. Chem. Soc.*, *30*, 205.—By Otto Fischer—*Dent. Chem. Ges. Berg.*, *9*, 463, 465.

nitroso-acetanilid, C_6H_5N (NO) C_2H_3O, is precipitated. The reaction is said to be nearly quantitative, but the compound formed is a very unstable body, decomposing when heated with water, and exploding when heated without it. The process is altogether too cumbersome to be of any use, practically, and a quantitative test for aniline is still wanted.

Acetanilid is likely to become one of the most important drugs of commerce. It has very rapidly gained ground since its recent introduction, and, now, besides being used as a febrifuge, it is also used as a hypnotic and sedative, a nervine and anodyne, an anti-arthrito-rheumatic and a mitigant of variola vera. There is but one case of poisoning on record in which a dose of ½ gram was given every two hours, instead of every morning.* It has these advantages over quinine, antipyrine, and other antipyretics:—It is four times as strong as antipyrine; given in small doses of 10 to 15-grains once, twice or, at most, 3 times per day; it has no troublesome after symptoms, and it is pleasant to take, being generally prescribed in some alcoholic liquor, or given in the aromatic spirits of ammonia, and sometimes given pure in the powder, as it has only a very slight taste.

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* *Phar. Record*, 1888, 11.

406; *38*, 105, 547; *42*, 1084; *44*, 56, 325 and 326; *46*, 665, 1012, 1016 and 1295; 48, 978, 983; *50*, 451.

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Ther. Gazette, 1886, 697.

Liquor Legislation and its Relations to Pharmacy,

READ AT A JOINT MEETING OF THE A. P. A., AND THE M. S. P. A. AT DETROIT, SEPT. 4, 1888, BY FRANK WELLS.

The statement will scarcely be contradicted that no other subject has affected the interests of pharmacists to so great a degree as that of liquor legislation in its various forms.

This legislation exists in National, State and municipal enactments, having for their objects the suppression, regulation or taxing of the business of liquor selling, and is inspired by both moral sentiments and political beliefs. Except in its phases liquor legislation is not new in this country. As early in our history as 1639 a law existed in Massachusetts to restrain intemperance. For the purpose of diminishing their use, Pennsylvania laid a duty in 1772 on spirits imported into the State and also on those of domestic production.

In 1790 the College of Physicians of Philadelphia memorialized Congress "to impose such heavy duties on distilled spirits as shall be effectual to restrain their intemperate use in our country."

From the organization of the Methodist Church in the U. S. down to the present time this denomination has taken strong grounds in favor of temperance and of laws to promote it.

Other religious societies, and especially a large proportion of the clergy during our early history, were alive to the demoralizing effects of intemperance and made strenuous efforts to suppress it.

They sought, by both precept and example, to induce people to drink nothing stronger than wine, except under peculiar circumstances, and in extremely moderate quantities. But all these exertions were local and spasmodic, and the evil continued to increase until the use of wines and liquors as beverages was well nigh universal. The effects of this general indulgence became apparent and appalling, but no means to prevent or diminish them gave any promise of success until the great Washingtonian movement of 1840 swept over the country. Unlike previous attempts at reform, this one was based upon the theory of total abstinence both from wines and from spirituous and malt liquors. Its achievements were marvellous, and the great moral awakening it excited soon found expression in legislation. Previous to this period the laws regulating the sale of liquors were those granting licenses to dealers. Now began the great contest between those favoring this system and those who believed in entire prohibition of the sale of liquors except for medicinal or mechanical purposes.

Beginning with Maine, State after State voted against license and in favor of prohibition, until, in a majority of States, traffic in liquor as a beverage was by some kind of statuary enactment made a crime and punished by severe penalties.

The results failed to justify the hopes of those who expected to legislate men into habits of sobriety.

By some the failures were attributed to defects in the laws and by others to the principle upon which the laws were based. A demand was made by one of these classes that prohibitory laws should embody more stringent provisions and severer penalties, while the other class saw only failure in any prohibitory law, and sought by taxing the business heavily to make it less remunerative and thus either destroy it entirely or severely cripple it.

The views of both classes have been adopted in different States and both systems are in active operation throughout the United States and are being thoroughly tested. It is not my purpose to advocate either of these methods. You are all familiar with them and have your opinions concerning their comparative value.

Both tax and prohibitory laws recognize a necessity for the sale of liquors by druggists and make provision for this purpose under various restrictions. In recent liquor legislation there has been a tendency to increase these restrictions, frequently to an unreasonable extent.

In some States the complicated and annoying processes by which pharmacists are permitted to sell liquors for legitimate purposes, are so perplexing that some honest dealers prefer to relinquish this branch of their business rather than incur the vexations of the vast detail surrounding it or the many risks involved.

Under every kind of restrictive legislation an inviting field has been opened for the unscrupulous, in the profession to profit by illegitimate traffic. So prompt have these been to take advantage of their opportunities, that in the minds of many, drug stores and druggists are synonyms of grog shops and saloon-keepers. It is these saloon druggists who sully the fair name of pharmacy everywhere by their selfishness and hypocrisy, and who are responsible for the tendency in legislation to multiply the embarrassment of those who seek to do a legitimate business only. How best

to relieve ourselves from the stigma cast upon us by them and to secure legislation in the various States which will permit, under proper safe-guards, the sale of liquors strictly for medicinal purposes, and to suppress drug saloons, is a problem which should receive the careful consideration of every State Association. We presume it to be true that the honest as well as the progressive pharmacists are in the majority, and that in all State Associations their councils and influence are potent. If this is the fact they should have such Associations assume an attitude which will convince legislators and all others, that they earnestly desire that druggists who prostitute their profession for gain, shall suffer the just penalties of the law, and endeavor to point out means by which this may be accomplished. By resolutions and by action, they should show to the world that in sentiment and deed they are in accord, in this matter, with all proper efforts to promote the welfare of society and the enforcement of law. The united action of any large association of citizens, which bears evidence of having been inspired by justice and truth, will always be respected and will always bear good fruit. A striking evidence of this has been recently exhibited by the M. S. P. A. At the last session of the State legislature a strong temperance sentiment dominated the minds of a majority of the members. This sentiment resulted in the passage of a local option law (since declared unconstitutional) and a law which largely increased the tax for liquor selling and the penalties for illegal traffc. A resolution was passed in a caucus of the dominant party to include druggists as liquor dealers and compel them to pay the tax to be imposed upon saloonkeepers, and a bill was immediately reported making no exemptions. But for the prompt and intelligent action of members of the State Association this bill would unquestionably have passed and the pharmacists of Michigan would have been classed by their State, as they are by the general government, as retail dealers in liquor, and com-

pelled to pay an annual tax of $500. Several large meetings composed of representative members of the State Association were held at Lansing. The situation was ably and thoroughly discussed with members of the legislature, and many of these who had come to Lansing with strong prejudices were made to believe that a majority of the druggists of Michigan were law abiding citizens, that they deprecated the acts of their brethren who were not, and whom they desired should incur the penalties of their wrong-doing, and suggested amendments to the law to accomplish this object. At the same time they insisted that pharmacists should be permitted to sell liquors for chemical, medicinal and mechanical purposes without being subjected to the tax imposed on liquor dealers. Through the manifest honesty of their purpose and by persistent effort they obtained all they asked. We believe that State legislation upon the vexing subject of liquor selling may, by proper and intelligent effort, be so directed as to protect the best interests of pharmacy and of the people. To accomplish this it is necessary for druggists and the State Association with which they are connected to take high moral grounds upon the question. There should be no alliance between pharmacy and rum selling. Insist that those who seek to conduct a business which the whole civilized world regards as nefarious, under the cloak of an honorable calling, be compelled to march in the ranks of the gang to which they properly belong, and then demand by all the power of numbers, actuated by honest motives, that you be permitted to furnish to the sick, any medicines they may need, without either disgrace or penalty.

But it is not State legislation alone which affects the interests of pharmacy. Among the earliest taxes imposed by the general government at the beginning of the war of the rebellion, were those upon the manufacture and sale of spirituous liquors. No distinction at that time was made between those who sold as a beverage and those who sold

for other purposes. The object of the tax was not to restrict the traffic but to obtain as large a revenue as possible from it. In those stirring times few druggists considered the opprobium of being styled by the parent government as "retail dealers in liquor" and being compelled to pay the saloon-keepers tax.

Since the close of the war, efforts to be relieved from the tax and the name, have been confined largely to resolutions of various Pharmaceutical Associations and petitions to Congress, asking for a repeal of the entire excise law. Had any general effort been made asking for a change in the law exempting druggists only from the payment of the license, there is reason to believe it would have been successful and that pharmacy would have been relieved from this thraldom.

The A. P. A. and many State Associations have passed resolutions and made other efforts to induce Congress to abolish both the license and the tax. The National Wholesale Druggists Association, composed largely of manufacturers, have done more effective work than any other organization to secure the repeal or modification of the present law. At the annual session of this association for 1884 the committee of legislation reported that they had "mailed to a leading drug house in each city and town of consequence throughout the United States two copies of a petition to Congress for signatures." This petition claims to emanate from "wholesale druggists, retail druggists, manufacturers of perfumery, and manufacturers of pharmaceutical and chemical preparations." It gives a history of former excise duties levied by the United States for revenue, during the Revolution and war of 1812, and furnishes evidence from various sources to prove how unpopular such duties were and how soon they were repealed when the necessity for their existence had ceased. It shows that the tax on alcohol increases largely the cost of ethers, tinctures, chloro-

form, varnishes, proprietary medicines, etc. It states that the tax is unnecessary as the government does not need the money derived from it. It argues that as a very large proportion of distilled spirits are not used as beverages, the fact must not be overlooked that the tax strikes a blow at some very important industries of the country. The committee then report that their efforts resulted in securing only 1,118 signatures to these petitions in the United States. That the congressional committee to whom they were referred never acted upon them. The apathy of druggists is explained by the statement "that the druggists of this country are far from being a unit on the question of repealing internal tax laws." The report quotes largely from an able article by Dr. Squibb showing the futility of the proposed plan of adding a small proportion of methyl spirit to grain alcohol in order to make it valueless as a beverage, while not injuring it for most other purposes. Dr. Squibb insists that for nearly all uses the presence of methyl alcohol would be injurious, while the dishonestly disposed could remove the objectionable article from grain spirit at small expense. This able and valuable report concludes by characterizing the tax as excessive, demoralizing, and inviting to fraud, and that the belief that cheap liquor favors intemperance is a mere sentiment and true only to a very limited extent.

Since this presentation of the case, so largely from the standpoint of the manufacturer, many of this class have become convinced that the 'mere sentiment' which opposes cheap whiskey on temperance grounds, is too strong at the present time to be successfully resisted, and they have therefore directed their efforts to have the internal revenue law so modified, as to permit untaxed alcohol to be used in the arts, and for medicinal purposes. The difficulties in the way of changing the law, or of framing a new one, which shall require that a portion of the alcohol manufactured be taxed, while permitting another portion to be

used which has not been taxed, without opening wide a door to fraud and offering rewards to the dishonest, certainly seems insurmountable.

It is true that the law now provides for a similar discrimination in favor of colleges and other institutions of learning. These, by furnishing bonds to secure the government against fraud, have the privilege of using untaxed alcohol for scientific purposes. In these cases limited numbers, high character and absence of continual temptation to evade the law, have secured, so far as is known, freedom from dishonesty.

Would this be possible under any safeguards which might be devised, were taxed and untaxed alcohol furnished to the 40,000 wholesale and retail dealers in drugs and manufacturers of articles into which it enters in the United States? Would not the class which now evades State laws, find means to evade any possible restriction intended to prevent the use or sale of the untaxed spirit? Any conceivable arrangement whereby dealers shall be permitted to hold the taxed and the untaxed article side by side in their stores, the one to be sold and the other to be used by them for manufacturing purposes, will be a premium offered for dishonesty and a reward for unlawful practices. It would be a travesty upon law should this great temptation be placed before a large class of citizens.

In Dr. Squibb's article on the "Alcohol Question before Congress," the N. W. Druggist's Association's report fails to quote what the Dr. says concerning the difficulty of making a distinction in law between spirits used as beverages and for other purposes. He shows clearly the impracticability of the plan and predicts that should it be attempted, a new crop of tinctures, beef wine and iron preparations, bitters and elixirs will immediately spring up to supply the needs of fashionable tipplers. We can scarcely believe, therefore, that any intelligent person familiar with the retail drug business, can expect that both taxed and untaxed spirits

will ever be furnished at the same time to pharmacists, by the government. But is it not feasible to supply those who manufacture exclusively, and therefore do not unite with their business the *sale* of spirits, with untaxed alcohol under similar restrictions to those imposed upon colleges? This certainly seems possible, and it is not impossible that some practical plan by which this can be accomplished without much risk of fraud, may be devised.

We believe that many who are now urging with so much force the division method, have this in view. It would secure for manufacturers all they claim, the lessening of the cost of their products, and, except in the case of proprietary articles, their price to consumers. These results would be obtained without tempting the cupidity of 30,000 druggists, as they would only be provided with alcohol which had been taxed. The patent medicine men, the fluid extract men, the ether and the chloroform men, with free alcohol for themselves alone, would cease their efforts to have this relic of the war, as they now term it, entirely removed, and would begin to appreciate that sentiment, held by so many, that alcohol in its *ordinary* forms is *the most appropriate article in existence to be taxed.*

With this manufacturers' privilege achieved, the millenium of the retail druggist would be reached. He would prepare nothing. He could not afford to prepare anything containing alcohol, and his friend, the manufacturer, already furnishes him with everything else. All druggists would become, what so many are now, mere merchants. Outside the manufactured articles belonging to pharmacy, of which alcohol forms no part, druggists are purchasers and not manufacturers. Of articles prepared through the agency of alcohol, a varying, but quite large proportion are made by druggists. It has been one of the aims of the A. P. A. and of most State Associations to increase this proportion and to induce pharmacists to make every chemical and every compound needed in their business

which it is possible for them to make with profit. The pecuniary compensation in so doing has been urged, not because it should be the only inducement, but because it is usually the most effective.

Increasing knowledge will naturally inspire a professional pride in his own skill and should furnish a motive greater even than gain to the pharmacist to manufacture more and more largely for himself. But neither profit nor pride can be appealed to, should this great advantage be given to manufacturers. Pharmacy would then reach a level, already reached by many of the other branches of the medical profession, who indolently take from the hand of some favored manufacturer whatever he may choose to give. It is the boast of these manufacturers that they furnish better products, and cheaper, than most pharmacists can produce, and it is not to the credit of pharmacy that there is so much of truth in the boast.

But the ignorant are being rapidly weeded from our ranks, and each year marks an advance by the profession to a higher position.

Through associated effort, through schools of pharmacy, through periodical literature of a high order devoted to our interests, and through pharmacy laws, our labors have been inspired by the hope that we might elevate the standard of knowledge and skill of our calling.

You are all familiar with the success which has thus far crowned these efforts, and we ask *you*, if we shall voluntarily surrender any of their fruits. Shall we commit any act, the tendency of which shall be to degrade to a mere trade, what we proudly call, and have endeavored to make, a profession? Shall the experience and the knowledge of the sciences allied to our art, which the laws of nearly all the States demand that we possess, be of no value, except to properly read the labels of elixirs, tinctures and extracts, classify them by the names of their

numerous manufacturers, and dispense them with automatic precision?

When we manufacture nothing our vocation will reach this point. The physician will then see less reason for our existence than he now does. He will receive his favorite prescriptions in bulk from a manufacturer with whom no druggist can compete, and soon the prescription scales and other parapharnalia of the pharmacist, already started, will take up their line of march for the doctor's office. The bazaar, the grocery, and the dry goods store will then divide between them the patent medicines, perfumery, cigars and paris green which will form the remainder of his stock, and after lingering sadly a few days with his soda fountain and 'milk-shake,' the druggist will disappear forever. This is not a mere fancy, but a true picture of the probable results of a tendency likely to be greatly increased by the course we have been considering. The time, for many reasons, may be regarded as a critical one for the pharmacist. His business is assailed in many ways. Dealers in other lines make use of his most profitable articles as baits to allure customers. Owners of proprietary medicines gradually rebate his compensation for dealing in their wares. His State and the Nation pollutes his reputation, and then tax him for the pollution. He is made the victim of 'trusts' in nearly all the staples he sells. The jobber frequently relieves him of his best customers. Finally, his natural and long time ally, the doctor, refuses him the share in the profits they both earn, and filling his office from some laboratory, with material purchased at wholesale prices, or less, prepares his own prescriptions. Shall he then voluntarily aid his own downfall by yielding to specialists that portion of his business which is most profitable, and which should be peculiarly his own? Shall he make himself in any way responsible for the change demanded, if such change is likely to take out of his hands a large part of his occupa-

tion, his reputation and his means of living? It seems to us that he is now confronted with this question, and that he should only answer it after carefully weighing the claim made by manufacturers, that their interests and his are identical, and that therefore he should aid in securing the amendment to the liquor law which they seek.

Let us now consider briefly whether duty or interest demand of us special efforts to obtain the *entire* removal of the tax on spirits.

We believe it to be a truism in business, having no limit perhaps except in the case of medicines, that the consumption of an article which fills a real or fancied want of man, is increased by diminishing its cost. It follows, if this be so, that the cheapening of any of the beverages of which alcohol forms a part, will increase the quantity of such beverage used. Whether such increase would prove a blessing or a curse we will not argue. Untaxed spirits would certainly reduce greatly the cost of a long list of chemicals, pharmaceutical compounds, patent medicines, and of articles used in the arts. This reduction would be a great advantage to the manufacturers of such articles, and to the consumers of many of them.

The effect of untaxed spirits upon the *profits* of druggists is of interest, and should be considered. Profits upon all merchantable commodities bear a general relation to their cost. The compensation is greater usually on an article sold for a dollar, than on one sold for a dime. The reduction in the price of medicinal merchandise into the composition of which alcohol enters would therefore correspondingly reduce the profits upon them. A similar reduction in the cost of such alcoholic articles used in the arts and sold by druggists would not exhibit a corresponding reduction, as such loss would be compensated for by increased sales. Of the latter class the list is much smaller than of the former, and the belief seems warranted therefore, that the removal of the tax upon alcohol, will, on the

whole, diminish the profits of the druggist. This belief, if true, should not influence our action if it can be shown that the public good requires free spirits, and that its best interests are seriously jeopardized by the tax. That the wants of the people are disregarded by this tax, and that they demand its abolition, has been expressed in many petitions to Congress, but none of these petitions, so far as we know, have emanated from the people whom it is claimed are aggrieved and injured. *They* have meekly submitted to this great wrong, and have not raised their voice to demand that it shall be righted. If public necessity, or public virtue requires cheap spirits, why do the public refrain from making their wants known to the government? Is there then any reason to believe that pharmacists have an interest in this question not shared by people generally, unless it be the questionable one of pecuniary profit, and should we be expected to champion an alleged popular cause, which no popular expression has yet recognized? How much of obligation to the public is due from us, in aiding to reduce the cost of those necessities of life which owe their existence to alcohol on the one hand, and how much of obligation is due from us to the same public, in withholding our aid from efforts intended to reduce the price of beverages made from alcohol on the other hand, should, we think, be left with the judgment and moral sense of each individual, for his decision.

The subject of liquor legislation which we have been considering, though old, is far from being settled. So long as men's appetites dominate their reason, States will pass laws to prevent the gratification of such appetites, and so long as men's cupidity overcome their honesty, men will seek to evade these laws for personal gain. The extensive system of liquor taxation and license of the general government, starting as a necessity of the war, and developing into a means of raising revenue of immense dimensions, has now existed a quarter of a century. Industries

and manufactories have grown up under it, and have prospered. Its burdens though great, have been those of necessary taxation, and have perhaps been felt less by the people than any other system that could have been devised. It taxes a luxury and one productive of much evil, and is therefore in line with a strong popular sentiment which finds natural expression in striking any kind of blow at an enemy to society. These conditions convince us that in both State and Nation there will for many years be liquor legislation, and consequently, relations of pharmacy to such legislation, to be affected. In our endeavors to adjust these, let us always have in view not only our duty to the calling we have chosen, but also those more extended obligations which we, in common with all men, owe to that society whose character we should seek to elevate, and to the laws to which we owe protection for life and property. In seeking to fulfill these obligations, and by endeavoring to secure the enactment and observance of such laws as will promote the best interests of the community, we shall do all in our power to place pharmacy on the high moral plane where it properly belongs, and secure for ourselves that noblest title known on earth, true American citizens.

Detection of Adulterations in Volatile and Fixed Oils by Means of Abbe's Refractometer.

BY SAMUEL P. DUFFIELD, PH. D., M. D.

Prof. Abbé of Jena brought before the Jena Society of Medicine and Natural Sciences, in 1879, an improvement upon all former refractometers. By means of Prof. Abbé's improvement the refractometer becomes of service in detection of optical quality of fluids and also of solids. By the original construction of this instrument the *total reflexion* which a thin film of transparent substance shut in between two glass prisms shows, is made available for discovering the exponent of refraction of light as also to get data for calculating its dispersion. The advantages which this method has over the method of Wollaston lies in the fact that while his method only permitted the examination of fluid bodies by total reflexion, Prof. Abbé's first refractometer contained a principle which was destined when more fully elucidated to solve the problem of also reaching with the same instrument the index of refraction of solids as well as fluids. Kohlrausch had constructed an instrument called by him total reflectometer (Annalen d. Physik und Chemie, Neue Folge, Bd. IV., pg. 1) and this proved the stepping stone upon which Prof. Abbé rose to the construction of his improved instrument.

Before I describe the instrument allow me a few words as regards light itself—as it will be necessary for you, to understand the working of the refractometer, to know something about light. It is certainly a fact that the Ancients had, according to our present knowledge, a very crude idea of light. The earliest theory which is now called the "corpuscular" originated with the disciples of Pythagoras who taught that vision is the result of particles or films emanating from the surfaces of visible bodies and entering the eye. This theory was met by the Platonists, that vision was due to the emanation or an influence

from the eye itself. Both of these theories have fallen as valueless, the Pythagorean or corpuscular receiving its death-blow from our own countryman, Franklin, who showed that if the particles were material they would have weight, and if they had weight, they would from their immense velocity inflict such blows upon the eye, that its delicate structure would soon be injured and destroyed. There remained then but one course for philosophers to pursue and that was to follow the line marked out by Huyghens and the celebrated mathematician Euler, both of whom held that light, like sound, was the result of *wave motion.*

Laplace, Malus, Biot and Brewster supported Newton, and the theory of Pythagoras commonly known as corpuscular fought its way until it found its Waterloo in the labors of Thomas Young and Augustin Fresnel. These two eminent philosophers while adducing whole classes of facts not explicable by the Newtonian theory succeeded in establishing the most complete parallelism between the motion of light and the waves of sound.

The justification of a theory consists in its complete explanation of all the phenomena, and as all the phenomena of light admit of satisfactory mathematical explanation as regards double refraction and polarization, it has been called after that of gravitation the most comprehensive and happy of all the hypothetical generalizations of physical science. On the other hand the necessity of having to suppose an ether to transmit these waves of light has called from Rankine, of Glasgow, the view that possibly a force acting upon particles at a distance, and having opposite polarity would more fully explain matters. Nevertheless the wave theory has been deepening its foundations and making them more secure and until we can find a better one, proved so mathematically, we must take it in explaining the working of the refractometer. The instrument and the principles of its working are shown below in

the several cuts. Fig. 1 will aid us in describing a ray of light.

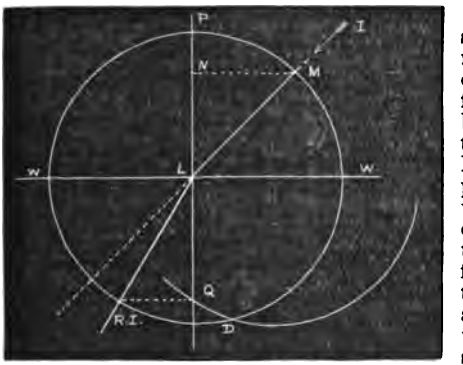


FIG. 1.

Let W W represent a section of the reflecting medium. I L the incident ray. L R the refracted one. Let P L Q be the perpendicular to the refracting surface. Passing through the point of incidence L, with any radius L R described from the centre L the circle R M P from M and R, let fall the perpendiculars M N and R Q on P Q. M N will then represent the sign of angle of incidence, I L P and R Q the sign of the angle of refraction, R Q L. M N ÷ R Q gives the index of refraction which is the same for the same substance whatever be the angle of refraction. In the diamond for instance, M N is always 2½ times as long as R Q. In water it is 1⅓ times the length of R Q.



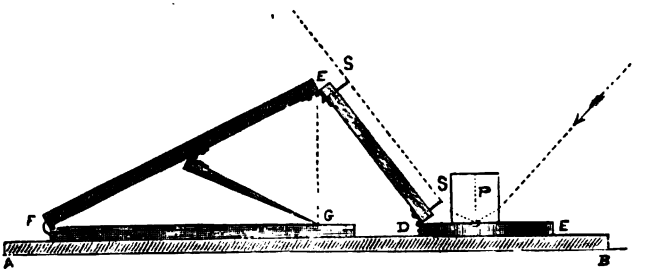
CUT 2.



CUT 3.

This is the instrument (see Cut 2). It consists of a double prism and a telescope, and in the telescope are two prisms called amisee prisms, which are intended to polarize the light. The numbers 1.3, 1.4 and 1.5 (see Cut 3) with decimals intervening, represent the indices of refraction on the sector, C. The drum, A (Cut 2) is rotated until a perfectly colorless light is obtained. When you look through any valatile oil put into it between the two prisms you will find the different colors of the rainbow, violet, indigo, blue, green, yellow, orange, red, in other words, the spectrum. You turn the thumb-screw just above the drum, A, until you reach the point at which there is a dark shadow, but colorless on its edge. Inside there are crossing lines or filaments like those in a surveyor's instrument, so that you can bring the shadow which falls by the refraction of the light up to the crossings of the square lines, as soon as you reach the point of cutting evenly across the square line, which is done by moving the prism by means of the sliding index B (Cut 3) on the sector C. Moving the prism we reach the point in which the shadow, caused by the prism, up through the telescope, runs across the four lines and cuts them evenly across. We call that the point of reading, and by turning the drum A (see cut 2,) around we render the field of view perfectly colorless, and you then read it. Then you turn the instrument upon its side and read the figures on the sector C which gives you virtually the index of refraction. The old way was to get the angle at which the prism stood and by calculating the angle of réfraction you arrived at the result and reached what was called the index of refraction. Now Prof. Abbé has so arranged his instrument with the movable index B, that we have the index given us without any calculation. The ray of light is bent in passing through the prism from its direct line in this way, (see cut 1,) L–R–Q, forming the angle of refraction. The angle of incidence is represented by M–N–L. The sign of the angle

of incidence divided by the sign of the angle of refraction gives you the index of refraction. To make these calculations on paper would require from two to three hours, while it is done instantly by the motion of the index attached to the prism. The sector reads from 1.330 to 1.650 index of refraction. Wollaston reached the same result in his method. He constructed an instrument with the sights



CUT 4.

S, $\frac{S}{\varphi}$,—(see cut 4,) similar to those of a gun. He looked into the square prism P and another prism was placed back of it, the light striking it from (arrow.) By moving index G back, sliding it upon A, B, the index ran along F, G, and as this was divided into 16 inches he could read the inches and proportion, and that gave him the index of refraction. The lengths of the pieces E, F, and D, E, are proportional to the refractive powers of the prism and of air. This was called a total refractometer. Prof. Abbé by putting the oil of peppermint, tansy, wintergreen, sasafras, or any other volatile oil between the prisms in his instrument reaches a result at once according to the principles laid down.

You will remember we had quite a discussion in this city on dementholized peppermint oil. There were certain samples of oil sold in this city through some men who are manufacturing peppermint candies, and the *Free Press* made the statement that a certain amount of dementholized oil had been sold. It was found that most of the

oil had been used, and the gentleman who sold the oil, thinking *all* of it had been used, sued the *Free Press* for libel, claiming heavy damages. It became the duty of myself, and other experimentalists, to find out whether that was pure or impure oil; whether dementholized or not. Nothing but treatment by the polariscope and by the refractometer could detect it—of course you can detect dementholized oil by getting it below the freezing point, but to prove beyond doubt that it is not, the refractometer alone will give you the index of refraction of ordinary oil, and will reveal an oil that is adulterated with oil of camphor or anything else which has a different index of refraction. But the great difficulty with dementholized oil lies in this, that the refraction of the oil itself is almost equal to the refraction of the menthol, and we found it very difficult to find much change in the refraction of the oil after the menthol was taken out. It is only by distillation of the peppermint oil that we reach that point.

I give below side by side the behavior of the impure dementholized peppermint oil and also a sample of A. M. Todd's pure oil, in the refractometer at ordinary temperature of 70° Fahr:

Fractions.	Index Refractometer. Mean of Impure Oil.	Index of Refrac. Pure Oil.
1	1.46600	1.47000
2	1.46000	1.47220
3	1.46202	1.46305
4	1.46402	1.46255
5	1.46302	1.46305
6	1.46400	1.46355
7	1.46250	1.46505
8	1.46402	1.46550
9	1.46402	1.46600
10	1.46700	1.51405
11	1.46904	Too dark for estimation.
12	Too dark	

You will notice the first distillation shows 1.466, while the first refraction of *pure* peppermint oil distilled was 1.470. Second refraction 1.460 and second refraction of

pure oil 1.4722. The third is 1.46202 and the third of pure oil is 1.46305. Now, what makes the difference? There was a certain oil of camphor in the beginning, showing that the index of refraction in pure oil was entirely distinct from the index of oil that contained the oil of camphor. This was carried on until we reached the tenth fraction. The dementholized oil reached eleven fractions, while the pure oil reached only ten. We could not test it at all, it was too dark. The way to use the refractometer is: Turn the thumb screw to the left to bring the ray perfectly colorless, then take the index of refraction. Then turn it to the right and take the index of refraction and then get the mean by adding these and dividing it by two, giving 1.46502, (see table below).

IMPURE OILS.

35½ R., 1.46500
36½ L., 1.46505

2)2.93005

1.46502=Mean.

The real difference then in the reading of the two is only 0.00002, which is very accurate. We have the mean of the impure oil carrying camphor 1.465, while the pure or double distilled oil is 1.462 or 1.463. It is not only of value in testing volatile oils, but also the fixed oils. For instance, linseed oil. Cotton seed oil and linseed oil mixed registers at 1.477 and 75% of cotton seed oil would be 1.474. The index of cotton seed oil is so much more than the index of linseed oil that I will defy any man to put cotton seed and linseed oil so together that I cannot detect them. There are instances where the refraction in lard oil is so much like butter that another treatment is necessary. Sometimes in the analysis of butter it becomes necessary to take the Reichart method.

SPECIFIC GRAVITY.

Temp. C. 100°.

LARD	MARGARIN	BUTTER	BUTTERINE
0.8605	0.8601	0.8598	0.8672

REFRACTOMETER.

Temp. C. 20°.

LARD	MARGARIN	BUTTER	BUTTERINE	COTTON SEED OIL
1.4690	1.4692	1.4652	1.4693	
		1.4650	1.4733	1.4748

You will notice that the index of refraction for butter varies quite plainly from the margarin and butterine. Showing that a sharper defining line can be drawn by means of the refractometer. But in order to be sure of having the right index of refraction you must be careful to see that all moisture is evaported and you are dealing only with the dehydrated fats or olein. As evidence of this I cite an experiment made with fresh butter which was placed upon the warm prism and as soon as melted the index of refraction was taken and it read only 1.459, a sample of oleomargarin was also taken and it read exactly the same. On heating them for 12 hours in a water drying oven the results were entirely different. Where we have oils with refractive indices nearly alike, as for instance:

Cod liver oil, 1.4801
Linseed oil, 1.4820

2)2.9621

50% of each, 1.48105

Now we could be sure this mixture or an oil having the index of 1.48105 could not be pure cod liver oil, but at the same time we would be thrown into doubt as regards linseed oil for it varies from 1.4820 to 1.4835, according to the temperature.

How beautiful is the idea that most all adulterations will be shown by the ray of light as it comes to us from that glorious globe, 14,000,000 times larger than the one on which we stand. Those of us who realize that there is

a Creator are ready to exclaim: "Knowest thou the place where light dwelleth, that thou shouldst take it to its bound or understand the path to its house?"

We know yet but little about light. It certainly, if not considered eternal, is to be viewed of all physical forces as the nearest related to Deity for "His robe is the light."

This instrument is expensive, having cost 230 marks plus the duty of 25%, but there is a smaller instrument made that will meet all the requirements of druggists who do not care to calculate the dispersion of light, but wish to use it only for volatile oils. It costs about 105 or 110 marks and registers from 1.30 to 1.65, and is of practical service to the pharmacist.

I would call your attention to the fact that in using the instrument you must begin with the refractive index of a pure oil. You must know it is *absolutely* pure, because this is the basis on which all other experiments are made. If you start with impure oil you will be calculating on an impure basis. The question arises, what is there to certify that the instrument is correct? A drop of distilled water placed on the prism will read on the index of refraction 1,330 and you always adjust your instrument at the ordinary temperature to 1,330 of distilled water. That is your starting point. Your instrument is correct when it reads that way, and the next thing is the pure oil. Many of the oils sold as pure, for instance the true cinnamon oil, and the oil of nutmeg show adulteration with some oil with a lower index of refraction than the true oils. The instrument tells you the absolute purity of oils, and when one becomes thoroughly familiar with its workings he can in five or ten minutes tell whether an oil is pure or not.

DISCUSSION.

MR. HINCHMAN: How are doctors to get the standard of oil?

DR. DUFFIELD: The only way for them is to distill the oil or to know where their oils come from. A great many of the standards are already given. Prof. Dragendorff has given them. I have had samples distilled, but you could not swear in court unless you knew that the article you start with is pure. As soon as you get your standard the instrument remains correct. That crude refractometer Wollaston made over twenty years ago showed that olive oil will read 1.470 and to-day on Abbe's instrument, at ordinary temperature, olive oil reads 1.470, showing that the light flowing in from above has not changed one particle in its refractive power, and that you have something sure in using it in analysis.

MR. HINCHMAN: Doctor, do you recommend the instrument for general adoption ?

MR. DUFFIELD: I do; for the purpose of testing fixed and volatile oils it is the most accurate method we have.

MR. HINCHMAN: There are only a very few used, however, in this country.

DR. DUFFIELD: I do not know how many.

MR. JESSON: Do you not suppose such an instrument as that might be manufactured in this country at less cost?

DR. DUFFIELD: This instrument is manufactured by Zeiss, but he does not test them, Prof. Abbé does that. If Baisch & Lomb could have Prof. Abbé examine their instruments it would do. The mere mechanical parts could be made here, but the test of refraction must be made by one above the mechanic. The whole value of the instrument lies in its prisms. They must be made of glass of a certain refractive index.

MR. WELLS: How may an instrument be obtained?

MR. DUFFIELD: Through Carl Zeiss of Jena. I had to wait three months for this instrument. No doubt if

there should come sufficient demand for them they may be made in this country.

MR. EBERBACH: There is an agent in this country, Emerich, of New York.

DR. DUFFIELD: I would advise you in importing to get a consular invoice and have it sworn to, that should come to Detroit, if you are in the State, so you can come to Detroit and receive the instrument. In New York they opened my box and drove in long nails and endangered its being broken, then there is the expense of brokerage in New York and everything of that kind. You have to pay ten or fifteen dollars before you get through with it. On these scientific instruments they take advantage of us.

PROF. PRESCOTT: Is this paper of yours in shape to be published?

DR. DUFFIELD: These explanations would have to be written out. You are welcome to the paper, drafts and figures if you can make any use of them.

PRESIDENT: If there is no objection this paper will take the usual course and appear in our proceedings. Undoubtedly the Doctor will make changes necessary for publication.

MR. PARKILL: I should like to have the Association pay a little more attention to this paper than to make the usual reference. Dr. Duffield is a very busy man. He has made this question a study, and has taken time to prepare this paper for the Association. I feel very grateful to him and I believe all members of the Association do. I move that the Association extend to Dr. Duffield its sincere thanks for preparing this paper.

The motion was carried unanimously.

Medicinal Plants, *

Indigenous and Naturalized of the vicinity of East Saginaw, Michigan.

BY B. C. HESSE, SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

Natural Order:	*Ranunculaceæ.*
	Clematis Virginica.
	Anemone nemorosa.
	Hepatica acutiloba.
	Thalictrum anemonoides.
	Thalictorum dioicum.
	Ranunculus repens.
	Ranunculus abortions.
	Caltha palustris.
	Coptis trifolia.
	Aquilegia Canadensis.
	Hydrastis Canadensis.
	Actea alba.
	Actea spicata.
Natural Order:	*Berberidaceæ.*
	Cœllophyllum thalictroides.
	Podophyllum peltatum.
Natural Order:	*Nymphæceæ.*
	Nuphar advena.
	Nymphea odorata.
Natural Order:	*Sarraceniaceæ.*
	Sarracenia purpurasceus.
Natural Order:	*Papaveraceæ.*
	Sanguinaria Canadensis.
Natural Order:	*Cruciferæ.*
	Dentaria diphylla.

* The medicinal use of many of these plants is a narrow use, restricted to certain localities. Some of the plants in the list are not to be found in the drug trade. No responsibility is assumed as to the medicinal character of any plants of the list.

Cardamine rhomboidea.
Cardamine hirsuta.
Arabis Canadensis.
Brassica sinapistrum.
Brassica nigra.
Capsella bursa-pastoris.

Natural Order: *Violaceæ.*
Viola cucullata.
Viola rostrata.

Natural Order: *Caryophyllaceæ.*
Cerasteum vulgatum.

Natural Order: *Geraniaceæ.*
Geranium maculatum.
Oxalis acetosella.
Impatiens pallida.

Natural Order: *Anacardaceæ.*
Rhus toxicodendron.

Natural Order: *Celastraceæ.*
Celastrus scandens.

Natural Order: *Leguminoseæ.*
Melilotus alba.
Medicago lupulina.

Natural Order: *Rosaceæ.*
Prunus Virginiana.
Potentilla Canadensis.
Rubus Canadensis.
Rubus idæus.
Rubus occidentalis.
Rubus strigosus.
Rubus villosus.
Rosa blanda.

Natural Order: *Saxifragaceæ.*
Ribes rubrum.
Tiarella cordifolia.

Natural Order: *Crassulaceæ.*
Penthorum sedoides.

Natural Order: *Primulaceæ.*
Oenothera biennis.

Natural Order: *Cucurbitaceæ.*
Licyos angulatus.

Natural Order: *Umbelliferæ.*
Sanicula Canadensis.
Heracleum lanatum.
Cicuta maculata.
Osmoorhiza longistylis.

Natural Order: *Araliaceæ.*
Aralia nudicaulis.

Natural Order: *Cornaceæ.*
Cornus paniculata.

Natural Order: *Caprifoliaceæ.*
Triosteum perfoliatum.
Sambucus Canadensis.
Viburnum acerifolium.

Natural Order: *Rubiaceæ.*
Galium trifidum.
Cephalanthus occidentalis.
Mitchella repens.

Natural Order: *Compositæ.*
Vernonia fasiculata.
Liatris scariosa.
Eupatorium purpureum.
Eupatorium agertoides.
Eupatorium perfoliatum.
Aster cordifolia.
Erigeron bellidifolia.
Erigeron philadelphicum.
Bideus Beckü.
Helenium autumnale.
Lencanthemum vulgare.
Achillea millefolium.
Antennaria margaritaceæ.
Senicio aureus.
Krigia Virginica.
Hieracium œnosum.

Hieracium Gronovii.
Nabalus albus.
Sonchus oleraceus.

Natural Order: *Lobeliaceæ.*
Lobelia cardinalis.
Lobelia syphilitica.

Natural Order: *Ericaceæ.*
Pyrola rotemdifolia.
Pyrola elliptica.
Chimaphilla umbellata.
Monotropa uniflora.

Natural Order: *Plantaginaceæ.*
Plantago cordata.

Natural Order: *Scrop-hulariaceæ.*
Verbascum thapsus.
Chelone glabra.
Penstemon pubesceus.
Pedicularis Canadensis.

Natural Order: *Labiatæ.*
Monarda fistulosa.
Nepeta-cataria.
Lycopus Virginicus.
Scutellaria lateriflora.
Scutellaria galericulata.

Natural Order: *Bonaginaceæ.*
Cynoglossum officinale.

Natural Order. *Hydrophyllaceæ.*
Hydrophyllum Virginicum.

Natural Order: *Solanaceæ.*
Solanum dulc-amara.
Solanum nigrum.
Phycalis Viscosa.

Natural Order: *Gentianaceæ.*
Menyanthes trifoliata.

Natural Order: *Apocoynaceæ.*
Apocynum Cannabinum.
Apocynum androsæmifolium.

Natural Order: *Asclepiadaceæ.*
Asclepias cornuti.
Asclepias tuberosa.

Natural Order: *Aristolochiaceæ.*
Asarum Canadense.

Natural Order: *Polygonaceæ.*
Polygonum hydropiper.
Polygonum amphibium.
Polygonum Virginianum.
Rumex acetosella.
Rumex crispus.

Natural Order: *Euphorbiaceæ.*
Euphorbia conalata.

Natural Order: *Betulaceæ.*
Alnus serrulata.

Natural Order: *Araceæ.*
Arisæmá triphyllum.
Acorns calamus.

Natural Order: *Orchidaceæ.*
Cyprepedium pubescens.

Natural Order: *Iridaceæ.*
Iris versicolor.

Natural Order: *Liliaceæ.*
Medeola Virginica.
Noularia grandiflora.
Noularia perfoliata.
Polygonatum biflorum.
Erythronium Americanum.
Yucca filamentosa.

Natural Order: *Filices.*
Adiantum pedatum.
Osmunda cinnamomea.
Osmunda regalis.

QUERIES.

To be Reported Upon at the Meeting to be Held in Detroit, on Sept. 10, 11, and 12, 1889.

1. Abstract of Podophyllum.—What is the best working formula for a preparation most acceptable to physicians, and what name should it bear?

2. Acetic Acid.—What grades of this acid are more expedient for purchase by the dispensing pharmacist, and what are the surest and simplest tests of its strength and purity?

3. Aconite.—What preparation of this drug is, or would be, most suitable for administration by the physician?

4. Alcohol.—Are many tinctures liable to variation in strength, due to degrees of acidity in this solvent as used?

5. Antipyrine.—By what description and tests should the quality of this article be guarded?

6. Aqua.—"Natural water in its purest attainable state"—What tests should be given by the pharmacopœia?

7. Aromatic Tincture of Rhubarb.—What improvements should be made in this preparation, both for separate use and as a basis for the syrup?

8. Aspidium.—What substitutes, if any, are now offered in commerce for male fern?

9. Atropine Sulphate.—What is the chemical and physiological quality of the article in use?

10. Borax as an Antiseptic.—What are its claims, and the best forms of borax compounds, for this purpose?

11. Cannabis Indica.—What is the quality of the powdered extract, of commerce?

12. Carbolic Acid.—Shall the pharmacopœia give directions for a liquid form of the concentrated article? and, if so, what directions are suitable for highest uniform strength?

13. Carbonate of Ammonia.—Does the proportion of carbonate in the article in use agree with the chemical formula in the U. S. Ph.?

14. Chloral.—What improvement can be made in the pharmacopœial requirements for this article?

15. Chlorate of Potassium.—What changes, if any, should be made in the pharmacopœial standard for this article?

16. Citrate of Iron and Quinine.—Should the pharmacopœia present the "soluble" or the "insoluble" preparation, or both these forms?

17. Cotton Seed Oil.—What requirements and tests should the pharmacopœia present for this article?

18. Copaiba.—To what impurities is it most liable, and what requirements should be made for it in the pharmacopœia?

19. Compound Syrup of Squill.—What directions should the pharmacopœia give for its preparation? Accepted by Jacob Jesson.

20. Ether.—What is the quality of the article dispensed in this State?

21. Fluid Extract of Ipecacuanha.—What is the quality of the article in use?

22. Fluid Extract of Rhubarb.—How can its strength be determined?

23. Gaultheria Oil.—What name shall the pharmacopœia retain for this article?

24. Ginger.—What is the strength of the fluid preparations on the market?

25. Lactic Acid.—What is the quality of the article in use?

26. Liquor Potassæ.—How can the pharmacist best provide himself with this article and preserve it?

27. Menthol.—What requirements should be laid down for this article?

28. Milk of Magnesia.—A formula is desired for an identical preparation.

29. Oil of Camphor.—What is its value in medicine and pharmacy?

30. Oil of Peppermint.—What pharmacopœial tests will best govern the purity and quality of this article?

31. PEPPERMINT WATER, CAMPHOR WATER.—What are the best processes for their preparation? Accepted by C. S. Koon, Muskegon.

32. PERMANGANATE OF POTASSIUM.—What is the best way of administering this agent?

33. PHOSPHORIC ACID.—What tests and standards of strength of phosphoric acid can the pharmacopœia lay down for this article?

34. SOLUBILITIES AT A GIVEN COMMON TEMPERATURE.—Should these constants be adopted as those (1) of a solution remaining after deposition of the excess dissolved at a higer temperature, or as constants (2) of a solution by action of the solvent at the given temperature from the first?

35. SOLUTION OF SULPHATE OF IRON.—What is the profit in its preparation by the pharmacist? Accepted by Jacob Jesson.

36. SULPHITE OR HYPOSULPHITE.—What agent of uniform strength of available sulphurous acid can be recommended to physicians?

37. TEREBENE.—What is the quality of the commercial article?

38. TINCTURES.—If decimal ratios of their strength continue to be given at all in the pharmacopœia, should these be ratios to 100 weight, or ratios to volume of 100 weight of water?

39. VINEGARS.—What preparations of this class is it proper to retain in the pharmacopœia?

40. VOLUMETRIC TEST SOLUTIONS.—In the standards of strength of these reagents what improvements should be made by the pharmacopœia?

41. WINES AS GALENICAL PREPARATIONS.—What preparations of this class should be retained by the pharmacopœia?

42. SPIRIT NITROUS ETHER.—Can the U. S. Ph. process for this preparation be improved?

Members are earnestly requested to accept some of these queries. We need answers to many of these practical questions.

CONSTITUTION AND BY-LAWS.

Adopted at Petoskey, Michigan, July 13th, 1887.

PREAMBLE.

WHEREAS, Organization, concert of action, and comparison of ideas, are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore,

Resolved, That we, druggists of the State of Michigan, whose names are hereunto attached, in compliance with an act entitled an act to organize the reputable pharmacists of the State of Michigan into an Association to be known as the Michigan Pharmaceutical Association, approved April, 1887, do hereby organize ourselves into such Association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The object of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard, and, ultimately, to restrict the practice of pharmacy to properly qualified pharmacisists, and to promote by all legitimate means the business interests of it members.

ARTICLE III.

MEMBERSHIP.

Every pharmacist of good moral and professional tanding, whether in business on his own account or em-

ployed by another, and teachers of pharmacy, materia medica, chemistry, and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.

OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected by ballot at the third sitting of the regular annual meeting of the Association, and to serve until their successors are elected.

ARTICLE V.

DUTIES OF OFFICERS.

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, until the close of such meeting; call special meetings at the written request of twenty-five members; fill all vacancies that may occur in the offices of the Association between the annual meetings; shall present at each meeting a report of the Association, and perform such other duties as pertain to the office.

SECTION 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Excutive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and

election, and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all moneys for dues, and from all other sources, giving receipts for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee. He shall file a a copy of the proceedings of each annual meeting in the office of the State Board of Health, and of the Secretary of State, and shall keep at least three copies in his own office.

SECTION 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

SECTION 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association committed to their care.

SECTION 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.

MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.

BY-LAWS.

This Association may establish for its future government and regulation, such By-Laws, not in conflict with this Constitution, as may be deemed proper and desirable.

ARTICLE VIII.

AMENDMENTS.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.

QUORUM.

Twelve members shall constitute a quorum.

ARTICLE II.

MEMBERSHIP.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented to the Association in writing, signed by two members in good standing, and shall be referred to the Executive Committee, and if favorably reported by that committee, the candidate may be balloted for at once. A vote of two-thirds of the members present shall be required for an election.

ARTICLE III.

FEES.

The initiation fee of this Association shall be one dollar, which fee shall be paid to the Secretary.

ARTICLE IV.

DUES.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.

CERTIFICATE OF MEMBERSHIP.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.

COMMITTEES.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be an ex-officio member,) each to consist of three members, viz: Committee on Trade Interests; Committee on Pharmacy and Queries; Committee on Legislation; Committee on Adulterations.

SECTION 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.

SECTION 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close

of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable, to be reported upon at the next annual meeting.

SECTION 4. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.

SUSPENSIONS—AMENDMENTS.

SECTION 1. These By-Laws shall not be suspended without the consent of two-thirds of the members present.

SECTION 2. Any amendment to these By-Laws must be made in writing, and read before the Association at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these By-Laws.

ARTICLE VIII.

DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meeting of the American Pharmaceutical Association.

ARTICLE IX.

PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees and members, shall be published annually under the supervision of an editor, who shall be elected

annually and who shall be paid from the funds of the Association, and a copy of the proceedings shall be sent to each member of the Association less than two years in arrears.

ARTICLE X.

EXPULSION OF MEMBERS.

Any member or officer accused of violating the Constitution or By-Laws, or other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting. In every case definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the charges, and notify him in writing, at least two weeks in advance, of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense.

ARTICLE XI.

EXHIBITS.

The Association invites manufacturers and others to exhibit at the annual meetings, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.

RULES OF ORDER.—ORDER OF BUSINESS.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SECTION 2. The order of business shall be such as the Executive Committee shall prescribe.

Roll of Members.

☞Members whose names are marked with an asterisk were present at the sixth annual meeting.

Adams, H. M.	Port Huron	1888
Adams, C. H.	Otsego	1884
Adamson, J. W.	Holly	1885
Akey, J. V.	Colon	1885
Aldworth, F. G.	Grand Rapids	1884
*Allen, A. W.	Detroit, 410 G'd River Ave.	1883
Allen, Earl	Stanton	1887
Allen, E. F.	Boyne City	1885
*Alsdorf, F. M.	Lansing	1883
Amberg, Isaac	Battle Creek	1886
Anderson, Ellery	Midland	1884
Anderson, Maxon	Midland	1884
Anderson, Edwin S.	Detroit	1888
*Anderson, C. N.	Detroit, 24 W. Adams Ave.	1888
Andrus, C. S.	Detroit, 1151 Jefferson Ave.	1885
Andrus, E. J.	Utica	1886
*Armstrong, R. S.	Chelsea	1888
Arnold, W. C.	Kansas City, 1010 E. 18th St.	1885
Arthur, Hiram	Dowagiac	1887
Atchinson, F. E.	Gladwin	1888
Atwater, C. H.	Lapeer	1884
Baar, Henry	Grand Haven	1885
Babbington, John	Corunna	1884
Bachman, M. H.	Stanton	1883
Bahel, C. W.	Otsego Lake	1884
*Baier, C. G.	Detroit, 326 Gratiot Ave.	1883
Bailey, G. H.	Elk Rapids	1885
Bailey, Morrison	Plainwell	1886
Bailey, M. G.	Mackinaw Isl.	1888
Baker, Dennis	Grand Rapids, 89 Monroe Ave.	1885
Baker, H. C.	Detroit, T. H. H. & Sons	1888

Baker, W. H. ---------- Whitehall ---------- 1885
Baldwin, E. L. ---------- Ludington ---------- 1884
Bangs, W. Z. ---------- Holland ---------- 1885
Barber, M. A. ---------- Petoskey ---------- 1887
Barbour, W. G. ---------- Midland ---------- 1885
Barbarin, G. F. ---------- Freeland ---------- 1885
Barker, W. J. ---------- Ashley ---------- 1886
Barie, H. L. ---------- Detroit ---------- 1887
Barry, Frank ---------- Rodney, Mecosta Co. ---------- 1888
Barrows, J. F. ---------- Lawrence ---------- 1885
*Bartram, E. W. ---------- Paw Paw ---------- 1883
*Bassett, A. ---------- Detroit, 95 Woodward Ave. ---------- 1884
Bassett, E. C. ---------- South Lyon ---------- 1884
*Bassett, J. A. ---------- Detroit, (J. E. Davis & Co.) ---------- 1885
Bauer, A. C. ---------- Grand Rapids ---------- 1884
Baxter, T. A. ---------- Grand Rapids ---------- 1884
*Beach, L. T. ---------- Bay City ---------- 1884
*Beachum, C. B. ---------- Romeo ---------- 1884
Beaman, G. W. ---------- East Jordan ---------- 1886
*Beck, W. H. ---------- Detroit, 22 Bagley Ave. ---------- 1887
Beckwith, R. G. ---------- Bradley ---------- 1888
Beebe, Hosmer ---------- Eaton Rapids ---------- 1883
*Bell, John ---------- Lexington ---------- 1888
Belsher, W. E. ---------- East Saginaw ---------- 1884
Bennett, J. R. ---------- Menominee ---------- 1884
Bennett, L. T. E. ---------- Port Huron ---------- 1885
*Bennett, C. W. ---------- Quincy ---------- 1888
Bertram, Julius ---------- Alpena ---------- 1884
Bertram, J. P. ---------- Westphalia ---------- 1883
Bigelow, W. H. ---------- Owosso ---------- 1884
Bigg, A. H. ---------- Detroit, 255 St. Aubin Ave. ---------- 1884
Bird, C. E. ---------- Saugatuck ---------- 1884
Bird, Jr., Henry ---------- Douglas ---------- 1884
Bird, C. O. ---------- Detroit, 324 6th St. ---------- 1888
Birge, W. E. ---------- Kalamazoo ---------- 1884
Bisbee, A. B. ---------- Benton Harbor ---------- 1885
Blacklay, T. L. ---------- Jones ---------- 1884
Black, Josiah ---------- Detroit, 1115 Russell St. ---------- 1888
Blatchley, C. H. ---------- Manistee ---------- 1888
Black, J. R. ---------- Detroit, 51 Park Place ---------- 1888
*Blackmer, H. A. ---------- Charlotte ---------- 1884
Blair, C. A. ---------- Morenci ---------- 1885

Blakeslee, L. G. — Detroit, 177 Griswold St. — 1885
Blakeslee, N. P. — Elmira — 1886
*Boehnlein, George — Detroit, (F., W. & Co.) — 1886
Bolio, E. William — Detroit, 97 Div. Ave. — 1888
Bond, E. C. — Muskegon — 1885
*Booth, J. B. — Detroit, (P. D. & Co.) — 1888
Bostick, J. C. — Manton — 1887
Botsford, E. S. — Dorr — 1886
Bower, J. E. — Crystal Falls — 1887
Bower, Manley — Clarkston — 1883
Braddock, O. L. — South Bay City — 1885
*Brackett, F. E. — Cheboygan — 1887
Bricker, C. E. — Port Huron — 1888
Bridgeman, M. L. — Menominee — 1884
Briggs, J. W. — Schoolcraft — 1883
Bristol, F. E. — Lapeer — 1884
Bristol, U. D. — Lapeer — 1884
Brooks, Charles — Jackson — 1884
Brown, D. D. — Kalamazoo — 1885
*Brown, H. J. — Ann Arbor — 1883
Brown, I. V. — Galesburg — 1883
Brown, J. J. — Okemos — 1883
Brown, W. J. — Marquette — 1888
Browning, G. B. — Decatur — 1885
Brundage, Fred — Muskegon — 1886
Bruske, R. — East Saginaw — 1885
Buchanan, B. F. — Harrisville — 1883
Buchanan, B. S. — Detroit, 133 Woodward Ave. — 1888
*Bugbee, C. A. — Cheboygan — 1885
Bullard, E. A. — Vassar — 1883
Bullock, S. V. — Howard City — 1884
Burdick, H. H. — Bay City — 1884
*Burroughs, C. S. — Clinton — 1884
*Burwell, R. G. — Fort Gratiot — 1884
Cady, G. F. — Hart — 1883
Cahalan, J. C. — Wyandotte — 1884
Caldwell, G. G. — Centreville — 1885
*Caldwell, J. W. — Detroit, 242 G'd River Ave. — 1884
Calkins, S. B. — Petoskey — 1885

Campbell, Rob't A. — Port Huron — 1888
Campbell, Geo. — Grand Ledge — 1888

Calkins, E. E.	Ann Arbor	1888
Cameron, Alexander	Kalamazoo	1885
*Campbell, J. E.	Detroit, 477 G'd River Ave.	1888
*Carney, M. S.	Decatur	1885
Carpenter, A. D.	Cadillac	1885
Carrier, Hubert	Bay City	1884
Carroll, M. A.	Ludington	1885
Carroll, Watson	Ludington	1885
Case, George N.	Cheboygan	1887
Caulkins, Frank D.	Clarkston	1888
*Chamberlain, G. T.	Hartford	1883
*Chamberlain, M.	Horton	1884
*Champney, W. R.	Detroit, 27 Lafayette Ave.	1883
Chandler, C. A.	Cambria Mills	1884
Chapple, L. D.	Wayland	1886
Chester, E. F.	Cedar Springs	1888
*Church, H. M.	Holly	1884
*Clark, A. G.	White Cloud	1883
Clark, J. K.	Blissfield	1884
*Clark, H. C.	Detroit	1888
Claxton, W. C.	Calgany Alberta N. W. T., Can.	1885
Cleland, Henry	Detroit, 79 Montcalm St. W.	1885
Cleveland, H. W.	Nunica	1884
Close, Orrin E.	Spring Lake	1887
Coe, T. D.	Romeo	1884
*Coffin, C. L.	Detroit	1885
Collins, Jno. B.	Frankfort	1888
Cole, W. W.	Morenci	1885
Coleman, G. E.	Cadillac	1885
Coleman, H. G.	Kalamazoo	1884
Colwell, C. B.	Jackson	1886
Connine, Dewitt	Wexford	1885
Connell, F. G. L.	Detroit, 55 Montcalm St.	1884
Conrad, J. F.	Otsego	1886
Conway, V. R.	Sault Ste. Marie	1885
Cook, C. E.	Durand	1884
*Cooper, D. M.	Detroit, 371 Woodward Ave.	1884
Cooper, I. S.	Cheboygan	1885
Cornell, E. A.	Thedford, Ont.	1885
Cosford, J. W.	Mancelona	1887
Couturier, Noel	Provemont	1885
Covert, C. F.	———	1883

Crane, Geo. W.---Cheboygan---1886
Crawford, J. B.---Ithaca---1885
Crawford, Walter---Milford---1888
Crawford, Cornelius---Grand Rapids---1888
Crispe, John---Plainwell---1886
Crookston, J. A.---Grand Rapids---1886
Cross, F. E.---Grand Rapids, 453 Div. St.---1885
Crouter, G. W.---Charlevoix---1883
*Crowley, J. J.---Detroit, 421 Michigan Ave.---1884
Culver, R. W.---South Haven---1886
Curran, E. S.---St. Joseph---1883
Currie, A. A.---St. Clair---1885
Curtis, C. A.---Petoskey---1885
Curtis, J. B. F.---New Lothrop---1888
Curtis, F. E.---Napoleon---1885
*Cutler, W. R.---Ionia---1883
*Cushman, H. D.---Three Rivers---1884
Cummer, R. J.---Cadillac---1884

Damon, J. A.---Millington---1884
*Darling, G. S.---Tawas City---1888
Davis, T. W.---Detroit, 308 Woodward Ave.---1888
Davis, F. C.---Vassar---1888
Davis, G. S.---Detroit---1888
Davie, R. P.---Flushing---1886
*Davis, James E.---Detroit, 29 to 37 Larned, W.---1884
Dayton, A. J.---Grand Rapids---1887
Dean, H. M.---Niles---1887
DeBoe, John---Grand Rapids---1884
Deitz, G. A.---Cadillac---1883
Demorest, C. S.---Detroit, 153 Gr. River Ave.---1888
Dennis, G. C,---Rochester---1888
De Puy, C. E.---Stockbridge---1888
Dewey, C. C.---Napoleon---1885
Dewitt, P. A.---Spring Lake---1888
Dickinson, O. B.---Grand Rapids---1884
Dillon, James E.---East Tawas---1887
Dimick, S. H.---Ypsilanti---1884
Dodd, I. LeRoy H.---Buchanan---1883
Dodds, J. J.---Detroit, 51 and 53 Shelby St.---1883
Dodge, E. L.---Montague---1885
Dorrance, A. A.---Coldwater---1883

Dorr, F. W. ---- Manchester ---- 1888
Dunbar, R. H. ---- Parma ---- 1885
Dunham, E. W. ---- Grand Rapids ---- 1886
Dunlap, Thomas ---- South Lyon ---- 1884
Dunlop, J. W. ---- Clare ---- 1883
*Dupont, Wm. ---- Detroit, 182 Michigan Ave. ---- 1883

Eaton, H. H. ---- Boyne Falls ---- 1887
*Eberbach, O. ---- Ann Arbor ---- 1883
Eckerman, A. ---- Muskegon ---- 1884
Eldred, B. C. ---- Chesaning ---- 1885
Elliot, R. H. ---- Pontiac ---- 1885
Empey, M. C. ---- South Bay City ---- 1884
Emster, F. H. J. van ---- Bay City ---- 1885
Erskine, James ---- Rogers City ---- 1885
Erwin, M. J. ---- Harbor Springs ---- 1887
Escott, F. H. ---- Grand Rapids ---- 1884
Ester, Jas. ---- Grand Haven ---- 1888
Everhart, James ---- Wacousta ---- 1885

*Fairchild, H. B. ---- Grand Rapids ---- 1886
Fales, F. R. ---- Vassar ---- 1884
Farnham, E. ---- Casnovia ---- 1885
Farrand, J. S. ---- Detroit (F., W. & Co.) ---- 1884
Farrand, O. J. ---- Detroit ---- 1888
Fasquelle, L. J. ---- Petoskey ---- 1885
Fatin, C. A. ---- Almont ---- 1885
Fay, O. J. ---- Carlton ---- 1888
*Federer, E. C. ---- Detroit, (F., W. & Co.) ---- 1886
Fehlig, H. J. ---- Wyandotte ---- 1884
Feldman, Henry ---- Sault St. Marie ---- 1885
Feldew, A. S. ---- St. Johns ---- 1884
Fellows, C. A. ---- ———— ---- 1884
Fenton, A. W. ---- Bailey ---- 1886
Fenton, George L. ---- Kingsley ---- 1885
*Fincher, F. W. ---- Pentwater ---- 1883
Fisher, James ---- Marlette ---- 1887
Fisk, C. A. E. ---- Mancelona ---- 1885
*Foote, C. E. ---- Jackson ---- 1886
Foot, Wm. H. ---- East Saginaw ---- 1884
Fordham, M. ---- Elmira ---- 1885
*Fordham, W. W. ---- Elmira ---- 1884

Foster, W.	East Tawas	1884
Fournier, Lucien	Bay City	1884
Fox, J. R.	Cedar Springs	1886
*Frank, H. A.	Detroit, 291 Congress St.	1883
Francis, A. B.	Olivet	1887
French, C. S.	Hillsdale	1888
Fritz, T. H.	Cass City	1885
Frizelle, C. L.	Detroit, 26 Michigan Ave.	1884
Fulton, Robert	Detroit, 375 Baker St.	1884
Fuqua, C. B.	Big Rapids	1884
Gallinger, E. L.	Cadillac	1885
Gardner, A. R.	Fowlerville	1884
Gates, E. M.	———	1885
Gates, T. O.	East Tawas	1884
Geary, S. M.	Maple Hill	1886
Gebb, John A.	Benton Harbor	1887
Gerow, J. E.	Ovid	1883
Gibbs, N. C.	Big Rapids	1884
Gill, W. J.	Beacon	1884
Gladding, B. O.	Constantine	1883
Gladwin, H. L.	Merrill	1888
*Glazier, F. P.	Chelsea	1885
Gleason, E. G.	Richmond	1884
*Glover, J. H.	Detroit, 120 W. Congress	1888
Goldsmith, G. S.	Manistee	1885
Goodrich, L. C.	Kalkaska	1883
*Goodrich, L. A.	Hillsdale	1884
Goodsill, A. A.	Jasper	1884
Goodyear, W. H.	Hastings	1885
Goodwin, S.	Detroit, 362 Jos. Campau Ave.	1888
Gorsuch, C. H.	Waldron	1885
Gould, Otis	Henderson	1888
Gover, G. H.	Leaton	1884
Grandy, Francis	Fairfield	1885
Grandy, M. A.	Sault Ste. Marie	1887
*Grand-Girard, H. E.	Big Rapids	1888
Gregory, A. W. C.	Albion	1884
Greenthal, Julius	Detroit, 986 Michigan Ave.	1888
*Griffith, W. F.	Howell	1883
*Griggs, S. A.	Detroit, 81 Woodward Ave.	1888
Grosse, W. F.	———	1885

*Grunow, O. H.	Detroit, 182 Gratiot Ave.	1884
*Gundrum, George	Ionia	1883
Haan, G. T.	Grand Rapids	1884
Hackett, P. E.	Wolverine	1886
Haenssler, G. J.	Manchester	1885
Hagerman, F.	Birmingham	1886
*Haight, A. L.	Woodland	1886
Hale, H. G.	Nashville	1883
Hall, J. L.	Chatham, Ont.	1885
*Hall, W. A.	Greenville	1884
Halladay, O. A.	Hoylsville	1886
Haller, J. P.	Sault Ste. Marie	1885
Hallock, D. S.	Detroit, 764 Fort St. West	1884
Hall, Geo. C.	Detroit, 767 Larned Street, E.	1888
Halsey, L. J.	Utica	1884
Hamilton, E. A.	White Pigeon	1886
Hamilton, H. G.	East Saginaw	1884
Hamlen, R. J.	Detroit, 813 Gratiot Ave.	1885
Hanlon, Amos	Elk Rapids	1884
Happy, Charles	Maybee	1885
Harper, J. C.	Milan	1884
Harris, J. M.	Ironton	1887
Harrison, B. D.	Barron, Wis.	1885
*Harrison, D. A.	Paw Paw	1884
*Harrison, H. E.	Richmond	1884
Harshaw, W. D.	Pontiac	1885
*Hartz, H. I. J.	Detroit, 81 Woodward Ave.	1884
Harvey, E. C. T.	Port Huron	1885
Harvey, S. K.	Detroit, 232 4th St.	1884
Harvey, T.	Farmers	1884
Harwood, G. M.	Petoskey	1884
Harwood, Henry	Ishpeming	1885
Hastings, R. A.	Sparta	1884
*Hawkins, Henry	Detroit, 518 Hastings St.	1883
Hawkins, A. H.	Clayton	1888
*Haynes, D. O.	Detroit, 835 Jefferson Ave.	1886
Hazeltine, A. F.	Grand Rapids	1886
Heath, Fred	Muskegon	1884
Heimbach, S. J.	Constantine	1884
Herley, M. L.	East Saginaw	1883
Herrington, J. A.	Belleville, Wayne Co.	1884

Henderschott, Florence---Manistee---1888
Hessler, Will---Grand Rapids, 17 W. Bridge St.--1884
Hess, F. P.---Detroit, 453 Grand River Ave.---1888
*Hewett, J. S.---Milford---1884
Hewett, L. E.---Lansing---1883
Heysett, William---Ludington---1885
Hibbard, Frank---Evart---1884
*Hicks, W. H.---Morley---1883
Hicks, W. L.---St. Johns---1885
Higgins, D. W.---Scottville---1884
*Hinchman, Theo. H.---Detroit, 76 Jefferson Ave.---1888
Hinchman, J. M.---Detroit, 76 Jefferson Ave.---1888
*Hinchman, C. C.---Detroit, (T. H. H. & Sons)---1885
Hinds, E. J.---Midland---1886
Hitchcock, W. A.---Manistee---1885
Hisner, H. C.---Detroit, cor. Woodbridge & 3rd--1888
Hodges, F. A.---Parma---1888
*Hogeboom, J. G.---Saginaw---1884
Hogguer, F. F. W.---Detroit---1884
Hollister, C. E.---Detroit, 593 Michigan Ave.---1888
*Holt, A. E.---Detroit---1885
Hopkins, I. F.---Muskegon---1884
Hopkins, F. S.---Benton Harbor---1888
Horner, D. A.---Caro---1884
Hotchkiss, F.---Hastings---1884
Howard, Charles---Alpena---1885
Howard, W. S.---St. Joseph---1885
Hower, Nelson---Mendon---1885
Houp, Frank---Detroit, 328 Michigan Ave.---1884
*Hudnutt, F. O.---Hanover---1888
Hueber, C. H.---Port Huron---1888
*Hueston, G. C.---Northville---1885
Hull, C. W.---Bay City---1887
Humburg, Fred'k---Detroit, 934 Gratiot Ave.---1888
Humphrey, C. E.---Jackson---1883
Hunt, A. O.---St. Johns---1885
*Hunt, F. J.---Detroit, 12 McLean St.---1886
Hurd, A. E.---Davison Station---1884
Hurd, C. W.---Davison Station---1885
*Hurd, J. E.---Detroit, 208 Woodward Ave.---1884
*Hutchings, Wm.---Leslie---1884
*Hutton, R. J.---Detroit, 425 Antoine St.---1885

Hutty, F. A.---Grand Haven---1886
Huyck, E. E.---Clio---1888
Hyde, A. O.---Marshall---1883
Hyde, H. J.---Marshall---1884
Hynes, Quincy---Hastings---1885

*Inglis, Frank---Detroit, 177 Griswold St.---1883
Ingram, E. J.---Iron Mountain---1883

*Jackman, W. F.---Detroit, 287 Michigan Ave.---1888
Jamison, T. A.---South Boardman---1886
*Jesson, Jacob---Muskegon---1883
Johnson, C. B.---Palo---1885
Johnson, J. G.---Traverse City---1884
*Johnson, Wm. C.---Detroit, 120 W. Congress St.---1888
Johnston, Wm., Jr.---Detroit, 121 Jefferson Ave.---1888
*Johnson, O. C.---Ann Arbor---1884
Johnston, A. J.---Detroit, 271 Gratiot Ave.---1885
Johnston, W. S.---Detroit, 271 Gratiot Ave.---1884
Joslen, O. C.---St. Johns---1884
Judson, F. E.---Brighton---1883
Junker, Henry---Colon---1888
Jones, M. A.---Big Rapids---1888

Kay, G. A.---Detroit, 81 Woodward Ave.---1885
Keeler, W. H.---Saginaw---1883
*Kellogg, C. E.---Grand Rapids---1887
Kellogg, J. H.---East Saginaw---1884
Kellogg, J. L.---East Saginaw---1885
Kelley, David---Lyons---1885
Kelly, F. H.---Au Sauble---1884
Kelly, A. F.---Cedar Lake---1886
Kelsey F. E.---Ionia---1886
*Kemink, Theo.---Grand Rapids, 81 W. Leonard St.---1884
Kennedy, T. B.---Commerce---1886
*Kennedy, E. J.---Detroit, 709 Woodward Ave.---1884
Kenyon, W. W.---Howell---1884
*Kephart, H.---Berrien Springs---1883
Kephart, W.---Berrien Springs---1884
Kerr, Wm.---Detroit, 269 Jefferson Ave.---1888
Kestell, J. R.---Detroit, 695 Beaubien St.---1887
Kibbie, A. D.---Custer---1884
Kidd, A. J.---Benton Harbor---1885

Kimball, J. L.	Crystal Falls	1884
Kimm, D.	Grand Rapids	1886
Kimm, M. B.	Grand Rapids	1886
*Kinmont, B. F.	Tekonsha	1884
Kinsel, Wm. S.	Alpena	1886
Kirkwood. C. H.	Ishpeming	1884
Kirkwood, P. B.	Negaunee	1885
Kirtland, J. W.	Lakeview	1885
*Klingman, Theophil	Dexter	1885
Knill, Jr., H. C.	Port Huron	1888
Koon, C. S.	Muskegon	1885
Lacy, E. M.	Sault Ste. Marie	1884
Lane, I. D.	Sand Beach	1884
La Rue, C. M.	West Bay City	1885
*Lambert, B. L.	Detroit, 185 Jefferson Ave.	1884
Lamoreux, John	Lakeview	1884
Lamoreux, Sarah A.	Lakeview	1884
*Latimer, F. N.	Ludington	1883
Laubengayer, T. A.	Owosso	1884
Leasia, J. N.	Williamston	1885
Lee, E. D.	Ludington	1885
Lee, John, M. D.	Dexter	1883
Le Fevre, G. L.	Muskegon	1885
Leggett, I. J.	Paris	1887
Leland, N. P.	Gaines	1886
Lentz, Theodore	Detroit, Campbell Ave.	1885
*Lenhard, C. A.	Detroit, 446 Gratiot Ave.	1888
Leuschner, Richard	Detroit, 148 Randolph St.	1884
Lever, Henry	Newaygo	1884
*L'Hommedieu, F. C.	Detroit, 95 Woodward Ave.	1888
Litchfield, E. C.	Flint	1885
Little, A. F.	Aarwood	1885
Locher, H. E.	Grand Rapids	1885
Long, G. L.	Detroit, 115 Michigan Ave.	1885
Longwell, E. B.	Paw Paw	1884
Longwell, H. D.	Paw Paw	1885
Lonsbury, J. H.	Reed City	1886
Lonsbury, P. M.	Reed City	1885
Luce, Jr., W. O.	Caro	1885
Lunn, G. D.	Edmore	1885
Lusk, George L.	Owosso	1886

*Lyman, A. H.	Manistee	1883
Lyons, A. B.	Honolulu, S. I.	1884
*Mason, J. F.	Warren	1888
Matthews, J. J.	East Tawas	1888
Magdeleney, August	Detroit, Hubbard Ave.	1888
Mann, F. C.	Detroit, 20 Monroe Ave.	1888
MacKimmie, J. D.	Detroit, 28 Jefferson Ave.	1888
MacKimmie, J. A.	Detroit, 723 Fort St. West	1884
*Madill, Thomas	Detroit, 120 Henry St.	1884
Mahon, F. M.	Oscoda	1885
Malmgren, Gustav A.	Ishpeming	1887
Mann, Albert	Ann Arbor	1883
Mandigo, Della	Sherwood	1886
Mandigo, W. R.	Sherwood	1884
*Mason, C. A.	Flint	1885
Mason, G. B.	Saline	1883
*Marr, T. W.	Detroit, 333 Woodward Ave.	1885
Martin, A. F.	Imlay City	1884
Martin, C. L.	Elk Rapids	1884
*Martin, Henry	Jackson	1884
Martin, Susie A.	Hopkins Station	1885
*Marty, F. O.	Manchester	1887
Martyn, W. J.	May	1885
Mayer, F. W.	Sebawaing	1884
Maynard, T. C.	Gagetown	1884
Maxson, M. M.	Hudson	1885
McCoy, W. B.	Ironwood	1885
*McDonald, David	Kalamazoo	1884
McDonald, D. T.	Red Jacket	1883
*McDonald, George	Kalamazoo	1883
McDonald, Murdo	St. Johns	1885
McEvoy, J. E.	Manistee	1885
*McFarland, A.	Detroit, 693 Michigan Ave.	1883
McFarland, Wm.	Detroit, 506 Michigan Ave.	1884
McHenry, G. A.	Chippewa Lake	1886
McInnes, M. V.	Lapeer	1885
McKenna, J. D.	Salt River	1884
*McKibbin, R. S.	Detroit, 322 Fort St. W.	1888
McLean, C. E.	Jackson	1885
McMillan, Neal	Rockford	1887
McMullen, G. H.	Ionia	1883
McNeal, Byron	Byron Center	1886

McPhee, J. A.---Lake City---1887
Mead, H. L.---Escanaba---1884
Mead, J. N.---Escanaba---1883
*Meigs, M. I.---Camders---1888
Mills, T. H.---Port Huron---1888
Merrell, F. P.---Ithaca---1883
Merrell, M. C.---Webberville---1883
Merrill, A. C.---Cross Village---1887
Merriam, C. K.---Ludington---1883
Meseroll, D. C.---Jackson---1884
Mesick, H. J.---Plainwell---1886
Meyers, John---Mt. Clemens---1883
Meyers, J. K.---Muskegon---1885
Middleton, V. H.---Grand Rapids---1884
Miles, J. B.---Dexter---1884
Miller, H. J.---Fort Gratiot---1885
Miller, N.---Big Rapids---1886
Millikin, T. J.---St. Clair---1884
Millington, F. S.---Paw Paw---1883
Mills, L. M.---Grand Rapids---1886
Milner, C. H.---Big Rapids---1886
Millspaugh, G. D.---Albion---1883
Moore, John---Ann Arbor---1884
Moore, W. B.---East Saginaw---1884
Moorland, Charles---Hadley---1885
Morford, A. D.---Ypsilanti---1884
Morrison, A. W.---Constantine---1885
Morrison, Thomas---Wayne---1885
*Morris, H. M.---Detroit, 919 Gr. River Ave.---1888
Morris, S. S.---Pincomming---1888
*Mottram, J. H. H.---Detroit (J. E. D. & Co.)---1883
*Mueller, J. C.---Detroit, 120 Woodward Ave.---1883
Muir, J. D.---Grand Rapids---1886
Mulloy, Wm.---Minden---1884
*Murphy, J. W.---Battle Creek---1883
Myers, A. W.---Gobleville---1884

Nash, C. P.---Detroit, (T. H. H. & Sons).---1888
Nasmyth, P. F.---Detroit, 388 Baker St.---1888
Nelson, E. H.---Detroit, (Lamber & Lowman)---1884
Nelson, Pascal P.---Northport---1887
Newell, C. P.---Richmond---1884

Newman, E. P. ---- Lansing ---- 1885
Niver, W. H. ---- Chesaning ---- 1888
Norton, J. T. ---- Rochester ---- 1888
Noble, M. L. ---- Sparta ---- 1885
Noel, Gideon ---- Good Hart, Emmet Co. ---- 1884
North, S. J. ---- Grand Rapids ---- 1885
*Northrup, B. D. ---- North Lansing ---- 1883
Norris, J. L. ---- Casnovia ---- 1886
Noyes, K. W. ---- Paw Paw ---- 1886
Nurney, James ---- Au Sable ---- 1884

*O'Brien, J. R. ---- Detroit, 297 First St. ---- 1885
Orr, J. J. ---- Tecumseh ---- 1884
Orr, E. N. ---- Manistique ---- 1886
Orth, L. P. ---- Traverse City ---- 1886
Osborn, C. A. ---- Owosso ---- 1885
Osborne, G. A. ---- Luther ---- 1887
Osborne, W. E. ---- Grand Rapids ---- 1885
Owen, W. H. ---- Maple Rapids ---- 1886

*Palmer, B. W. ---- Detroit, 836 Jefferson Ave. ---- 1888
Padley, W. A. ---- Benton Harbor ---- 1885
Paige, L. E. ---- Sparta ---- 1886
*Parker, A. S. ---- Detroit, 747 Woodward Ave. ---- 1883
Parker, G. J. ---- Port Huron ---- 1883
Parker, O. J. ---- Howell ---- 1886
Parkill, C. P. ---- Owosso ---- 1883
*Parkill, S. E. ---- Owosso ---- 1883
Parkhurst, C. G. ---- Mason ---- 1885
Parkinson, E. A. ---- Traverse City ---- 1885
*Paquette, F. D. ---- Ludington ---- 1883
Passage, J. H. ---- Greenville ---- 1886
Patenaude, A. ---- Norway ---- 1887
*Patterson, B. M. ---- Detroit, 182 Gratiot St. ---- 1885
Pauly, L. ---- St. Ignace ---- 1887
Pease, J. F. ---- Big Rapids ---- 1885
Peck, A. W. ---- Grand Rapids ---- 1883
*Peck, J. E. ---- Grand Rapids ---- 1885
*Peckham, H. C. ---- Freeport ---- 1885
Pegg, H. D. ---- Morenci ---- 1884
Penberthy, Edward ---- Iron River ---- 1887
Perham, Jason ---- Kent ---- 1888

Perkins, T. W. ---------- Detroit, 333 Woodland Ave. ---- 1888
Perren, George L. ---------- Detroit, 780 Jeff. Ave ---------- 1888
Perrigo, L. ---------- Allegan ---------- 1886
Perry, D. B. ---------- West Bay City ---------- 1883
*Perry, F. W. R. ---------- Detroit, 709 Woodward Ave. ---- 1883
Pfeiffer, G. J. O. ---------- Detroit, 5J7 Jefferson Ave. ---------- 1888
Phelps, L. A. ---------- Saugatuck ---------- 1888
Phelps, L. E. ---------- Flint ---------- 1884
Phillips, H. S. ---------- Middleton ---------- 1888
*Phillips, E. F. ---------- Armada ---------- 1883
Phillips, F. S. ---------- Ogden ---------- 1884
Phillips, W. R. ---------- Battle Creek ---------- 1883
Pierson, L. R. ---------- Kalamazoo ---------- 1888
Pike, N. ---------- Morley ---------- 1886
Pinkerton, R. J. ---------- Bancroft ---------- 1884
Pinckney, C. A. ---------- Plymouth ---------- 1883
Pitcher, Sheldon ---------- Detroit, 450 Fourth Ave. ---------- 1884
Platts, Randolph ---------- Port Sanilac ---------- 1884
Plessner, Fred. ---------- West Bay City ---------- 1888
*Poole, C. A. ---------- Detroit, 647 Third Ave. ---------- 1888
Potter, H. W. ---------- Jenisonville ---------- 1887
*Power, J. O. ---------- Addison ---------- 1884
Prall, D. E. ---------- East Saginaw ---------- 1883
Pratt, G. O. ---------- Detroit, 723 Antoine St. ---------- 1884
Pratt, Stephen ---------- Howell ---------- 1885
*Prescott, A. B. ---------- Ann Arbor ---------- 1883
Preston, George ---------- Escanaba ---------- 1885
Preston, T. W. ---------- Milbrook ---------- 1886
*Price, O. J. ---------- Detroit, 485 14th Avenue ---------- 1883
Prittie, W. H. ---------- Detroit, 402 Cass Avenue ---------- 1885
Purdy, H. D. ---------- Fennville ---------- 1884
Purvis, G. A. ---------- Detroit, 983 Jeff. Ave. ---------- 1885
Putnam, A. S. ---------- Manistique ---------- 1888

Quick, J. B. ---------- Howard City ---------- 1883

Raider, J. F. A. ---------- Newaygo ---------- 1883
Raison, James ---------- Wakefield ---------- 1888
Randolph, A. M. ---------- Northville ---------- 1883
Ray, G. C. ---------- West Bay City (Banks) ---------- 1885
Raymo, Owen ---------- Wayne ---------- 1888
*Reasner, F. M. ---------- Jackson ---------- 1884

Redmond, J. A. — Sandusky — 1888
Reed, S. M. — White Cloud — 1885
*Reidy, Mike — Corunna — 1884
Revell, Sam'l — Roscommon — 1888
Reynolds, W. B. — Eaton Rapids — 1883
Rice, C. E. — St. Clair — 1888
Rich, J. W. — Manistee — 1885
Richards, F. P. — Detroit, 204 Jos. Campau Ave. — 1885
Richards, T. H. — Detroit, 780 Jefferson Ave. — 1884
Richardson, George — Ithaca — 1885
Richmond, T. W. — Bear Lake — 1888
Ringler, Eugene — Saginaw — 1884
*Ripley, L. G. — Montague — 1884
Robbins, J. J. — Hubbardston — 1883
Roberts, D. O. — Kalamazoo — 1887
Robertson, B. J. — Breedsville — 1884
Robinson, E. J. — Montreal, 831 Guy St. — 1888
Robinson, O. H. — Grand Rapids, 115 Chestnut St. — 1888
Robinson, Wm. H. — Detroit, Fort St. W. — 1888
Robson, W. L. — Williamston — 1883
Roche, W. J. — Lake City — 1884
Rodenbaugh, H. W. — Reedsville — 1887
Rodenbaugh, I. N. — Mancelona — 1886
Rodenbaugh, O. L. — Mancelona — 1885
Rodgers, E. J. — Port Huron — 1884
Rogers, LeRoy — Irving — 1886
Rogers, T. F. — Lakeview — 1887
Rogers, A. — Ravenna — 1888
Ross, E. W. — Detroit, 418 Cass Ave. — 1883
Ross, W. H. — Grand Rapids, Mt. Vernon Ave. — 1885
*Roussin, V. — Ludington — 1884
Rowe, Wm. — N. Muskegon — 1884
Royer, Jr. Theo. — Ann Arbor — 1884
Roys, H. M. — Farwell — 1885
*Ruchty, Louis — Detroit, 410 Gr'd River Ave. — 1884
Rudolphi, A. E. — Dowagiac — 1886
Rudolphi, Louis — Dowagiac — 1884
Rumer, J. F. — Richfield — 1885
Rundel, J. — Holton — 1886
Runner, J. W. — Shelby — 1886
Rushmore, W. — Elk Rapids — 1886

Sabin, C. E.	Centerville	1883
Sackett, S. M.	Monroe	1883
*Safford, O. P.	Flint	1883
Sawyer, R. J.	Menominee	1883
Sayers, J. A.	Seney	1885
Schaefer, Wm.	Carleton	1885
Schanher, Joseph	Negaunee	1884
Schimmell, G. R.	Ann Arbor	1885
Schulz, L. S.	St. Joseph	1885
Schumacher, A. B.	Grand Ledge	1884
Schumacher, A. C.	Ann Arbor	1887
Schumacher, D. A.	Manistique	1884
*Schott, A. A.	East Saginaw	1888
Scoville, G. R.	Manistee	1884
Seed, A. W.	Cass City	1885
Seeley, C. A.	Lansing	1888
Seibert, G. F.	Iron Mountain	1883
Seibert, M. L.	Marlette	1885
Severson, W. A.	Buchanan	1883
Sheldon, R. D.	Detroit, 453 Gr'd River Ave.	1888
Sheffield, W. E.	Vestaburg	1884
Sherling, F. W.	Grand Rapids	1885
Sherlock, T. J.	Otia, Newaygo Co.	1885
Sherman, H. B.	Marshall	1885
Sherwood, C. L.	Dowagiac	1884
Shook, D. L.	Coral	1884
Short, W. E.	Manistee	1884
Shortwell, R. H.	Leslie	1885
Sigler, F. A.	Pinckney	1885
Slawson, W. W.	Greenville	1886
Sloan, E. E.	Bancroft	1885
*Smith, A. B.	Trenton	1884
Smith, A. L.	Crystal	1886
*Smith, C. M.	Clarkston	1883
*Smith, Fletcher	Saginaw	1883
Smith, F. D.	Detroit, 919 Gr'd River Ave.	1884
Smith, H. W.	Farmers	1884
Snodgrass, S. K.	———	1888
*Snow, H. W.	Detroit, (F. Stearns & Co.)	1885
Snow, S. M.	Ludington	1883
Snyder, M. H.	Grand Marais	1885
Sorg, H. A.	Marine City	1884

Soule, C. A.---Eaton Rapids---1884
Spayde, W. H.---Bloomingdale---1886
Spencer, J. L.---Linden---1883
Spencer, M. Ella---Linden---1884
Sprague, O. L.---Owosso---1884
*Sprague, W. G.---Flushing---1883
*Stanley, C. D.---OneRama---1888
Stanton, H. N.---Sheridan---1885
Stanton, M. B.---Sheridan---1885
Starr, George E.---Plainwell---1387
Stearns, Fred.---Detroit---1884
Steele, Michael---Ionia---1885
Steketee, A. G.---Grand Rapids---1885
Steketee, G. G.---Grand Rapids---1885
*Steiger, E. A.---Detroit, 714 Rivard Ave.---1888
*Stevens, A. B.---Ann Arbor---1883
Stevens, C. R.---Northville---1883
*Stevens, F. D.---Detroit, 133 Woodward Ave.---1883
Stevenson, W. E.---Homer---1885
Stevenson, A. W.---Muskegon---1886
Stiles, T. P.---Chester---1886
*Stone, C. G.---Detroit, 580 Lafayette Ave.---1884
Stover, H. E.---Kalkaska---1886
Strachan, J. D.---Muir---1888
*Stringer, G. W.---Detroit, 898 Michigan Ave.---1884
Stringham, Wm. T.---Shelby---1888
Strong, J. L.---Bessemer---1886
Suffield, B.---Charlevoix---1886
Sullivan, J. H.---Whitehall---1885
Swaby, G. A.---West Bay City---1885
*Swayze, E. S.---Otisville---1888
Sweet, B. F.---Carson City---1885
Sweetser, F. E.---Port Huron---1888
*Swift, George---Detroit, 7 Griswold St.---1883
Swinnerton, W. W.---Niles---1888

*Taylor, C. W.---Loomis---1885
Taylor, E. J.---Vassar---1884
Taylor, J. A.---Detroit, 148 Third St.---1884
Terrill, B. E.---Muir---1886
Thompson, M. L.---Greenville---1888
Thompson, A. L.---Harbor Springs---1887

Thompson, H. G. — Menekanum, Wis. — 1886
Thum, Hugo — Grand Rapids — 1884
Tibbits, A. H. — Port Huron — 1885
Tibbs, W. H. — Grand Rapids — 1886
Tillitson, W. J. — Laingsburg — 1886
Tillson, Fred. P. — Ishpeming — 1887
Tilton, B. E. — Bay City — 1885
Tobey, N. I. — Sturgis — 1884
*Todd, A. M. — Nottawa — 1887
*Todd, F. J. — Detroit, (J. E. D. & Co.) — 1886
Todd, W. F. — Flint — 1883
Tomlinson, W. A. — Au Sable — 1884
Torontaly, Paul — East Tawas — 1885
Travis, F. A. — St. Johns — 1885
Treat, A. B. — Adrian — 1884
*Tredwell, J. H. — Detroit, 51 Shelby St. — 1885
Trempe, Joseph — Sault Ste. Marie — 1885
*Trombly, C. K. — Detroit, 594 Gratiot Ave. — 1888
Trowbridge, Theo. — Decatur — 1884
Tubbs, C. C. — Chesaning — 1883
Tucker, W. S. — Stanwood — 1886
Tullgren, A. — Iron Mountain — 1886
Tupper, F. L. — Meredith — 1885
Turner, D. D. — Whitehall — 1884
Turner, R. — Flat Rock — 1886
Tuttle, W. A. — Grand Ledge — 1883
Tweedale, J. R. — Muskegon — 1884

Van Bochove, R. — Grand Rapids — 1886
Vandecar, J. H. — North Branch — 1883
Vanden Belt, Nicholas — Detroit, 33 Lafayette Ave. — 1884
Van Slype, N. F. L. — Detroit, 255 St. Aubin Ave. — 1888
Van Wickle, F. W. — Sheeby — 1888

Van Der Veen, Jacob — Grand Haven — 1885
Van Leeuwen W. H. — Grand Rapids — 1885
Van Marter, Ezra — Leslie — 1884
Van Vranken, G. D. — Cadillac — 1885
*Varnum, E. O. — Jonesville — 1884
Varnum, G. C. — Jonesville — 1884
Vaughan, B. D. — Bellevue — 1884
Vedder, E. H. — West Bay City — 1885

Vennema, H. A. ---------- Monominee ---------- 1885
*Vernor, James ---------- Detroit, 235 Woodward Ave. ---- 1884
Vincent, J. T. ---------- Lapeer ---------- 1884
Voller, J. H. ---------- Evart ---------- 1886
Vyne, N. A. ---------- Fremont ---------- 1886

Wagar, F. G. ---------- Edmore ---------- 1885
Wagener, C. H. ---------- Big Rapids ---------- 1883
Wagner, A. ---------- Eastmanville ---------- 1886
Waite, C. M. ---------- Homer ---------- 1886
Waite, G. W. ---------- Coldwater ---------- 1884
Wait, S. E. ---------- Traverse City ---------- 1884
Waldorf, A. ---------- Detroit, 838 Mich. Ave. ---------- 1888
Wales, T. P. ---------- Portsmouth, Bay Co. ---------- 1885
*Walker, W. K. ---------- Lansing ---------- 1883
Walker, A. L. ---------- Detroit, 415 Woodward Ave. ---- 1888
Wallace, G. E. ---------- Hopkins ---------- 1885
Wallace, A. S. ---------- St. Johns ---------- 1883
Walsh, Heber ---------- Holland ---------- 1885
Walthausen, G. L. F. von ---- Bay City ---------- 1885
Walthausen, Werner von ---- Bay City ---------- 1884
*Waples, Grafton ---------- Detroit, 930 Michigan Ave. ---- 1884
*Ward, G. J. ---------- St. Clair ---------- 1884
Ward, W. A. ---------- Eau Claire ---------- 1884
Warne, F. C. ---------- East Jordan ---------- 1886
Warner, S. H. ---------- Marlette ---------- 1886
*Warner, W. A. ---------- Detroit, (T. H. H. & Sons) ---- 1884
*Warren, W. M. ---------- Detroit, 525 Jeff. Ave. ---------- 1888
*Watson, J. B. ---------- Coopersville ---------- 1884
Watson, W. A. ---------- Breckenridge ---------- 1887
Watts, Isaac ---------- Grand Rapids ---------- 1883
Wastele, Wm. ---------- Port Huron ---------- 1888
Watson, R. A. ---------- Detroit, 764 Fort St. W. ---------- 1888
Watz, H. G. ---------- Saginaw ---------- 1884
Webb, B. S. ---------- Alma ---------- 1886
Webb, H. J. ---------- Cassopolis ---------- 1888
Webb, E. T. ---------- Jackson ---------- 1885
*Webber, A. H. ---------- Big Rapids ---------- 1884
Weeks, A. A. ---------- Grattan ---------- 1887
Weise, H. L. ---------- Detroit, 592 McDougall Ave. ---- 1884
Weiss, J. ---------- Monroe ---------- 1888
Weller, Martin ---------- St. Johns ---------- 1885

Wells, C. A.	Brockway Centre	1886
*Wells, Frank	Lansing	1883
*Wetzell, H. A.	Detroit, 821 Jeff. Ave.	1888
Wheeler, C. F.	Hubbardston	1884
Wheelock, N. L.	Dowagiac	1884
Whelpley, B. I.	Hoytville	1884
Whipple, G. N.	Detroit, 222 Orleans St.	1885
White, A. F.	Port Huron	1885
White, L. T.	Eaton Rapids	1883
White, W. E.	Grand Rapids	1886
White, W. L.	Grand Rapids	1884
Whitfield, G. F.	Grand Rapids	1886
Whitton, R. L.	Perrinton	1884
Wicker, C. D.	Coldwater	1883
Wiede, Henry	Reese	1885
*Wiesinger, J. G.	East Saginaw	1884
Wiggins, A. H.	Lawrence	1885
*Wilber, C. H.	St. Ignace	1887
*Wilders, A. J.	Ortonville	1885
Wilder, E. P. B.	Oxford	1888
Wilkins, F. C.	Union City	1885
Willard, H. W.	Manistee	1885
Willard, Thomas	Bear Lake	1885
Willett, Frank	Monroe	1888
Williams, H. M.	Mason	1885
*Williams, W. C.	Detroit, (F., W. & Co.)	1884
Williamson, G. E.	Vassar	1885
*Williamson, John	Detroit, 81 Woodward Ave.	1884
*Williams, R. P.	Detroit, (F., W. & Co.)	1888
Williams, C. F.	Caledonia	1888
Williams, J. P.	Climax	1888
Wilson, E.	Stanwood	1887
Wilson, E. R.	Grand Rapids	1887
Wilson, G. A.	Charlevoix	1884
Wilson, L. S.	St. Joseph	1883
Wilson, M. V.	Sand Lake	1886
Wilson, W. B.	Muskegon	1883
Windover, W. V.	Detroit, 1328 Woodward Ava.	1888
Witherspoon, G. A.	Chatham, Ontario	1885
Witherspoon, P. E.	Harrison	1885
Wolf, J. G.	Hillsdale	1883
Wolfinger, C. E.	Hopkins Station	1884

Wood, J. E.	Charlevoix	1884
Wood, Will H.	Sheridan	1887
Wood, Wm. A.	Six Lakes	1888
Woods, T. T.	Belleville	1885
Woods, C. H.	Detroit, 524 Grand River Ave.	1888
Woolford, R. S.	Mecosta	1886
Woolsey, F. F.	Hartford	1884
*Worcerter, W. N.	Coldwater	1888
*Wright, Charles	Detroit, 15 Jefferson Ave.	1883
Wright, C. A.	Tecumseh	1884
Wright, E. A.	Pentwater	1885
*Wurzburg, F. J.	Grand Rapids	1884
Yates, H. W.	Big Rapids	1888
Yeomans, E. T.	Ionia	1883
Young, C. A.	Battle Creek	1884
Young, E. A.	Clio	1886
Young, S. E.	Lakeview	1888
Zimmer, Wm. A.	Manistee	1888

HONORARY MEMBERS.

Douglas, S. H., M. D.	Ann Arbor	1886
*Duffield, S. P., Ph. P. M. D.	Detroit	1887
Englehard, G. P.	Chicago, Ill.	1883
*Garrigues, S. S., Ph. D.	Ann Arbor	1884
Stowell, Mrs. L. R., M. D.	Ann Arbor	1887
Vaughan, V. C., Ph. D., M. D.	Ann Arbor	1887
Wrampelmeier, T. J., Ph. C.	San Diego, Cal.	1887

RESIGNED.

Clark, J. F., Climax.
Fink, L. C., Detroit.
Green, A. L., Layfette, Ind.
Goodyear, J. J., Ann Arbor.
Jefts, W., Big Rapids.
Kotcher, C. W., Detroit.,
Plaat, C. W., Grand Rapids.
Saltzer, A. B., Detroit.
Dodds, W. H., Detroit.

DROPPED FOR NON-PAYMENT OF DUES.

	DROPPED.		DROPPED.
Ahlborn, Augustas	1888	Hamilton, C. W.	1887
Andrews, S. N.	1888	Hullinger, James	1888
Arbour, Henry	1888	Hungerford, C. B.	1888
Arbour, M. T.	1888	Hunter, J. E.	1888
Banks, A. W.	1888	Kay, W. J.	1888
Bannard, H. F.	1888	Kenrick, E. H.	1888
Barbour, F. S.	1888	Kipp, F. E.	1888
Bence, G. W.	1888	Lee, A. B.	1888
Bessac, H. B.	1888	Leonard, H.	1888
Bigelow, C. F.	1888	Lobdell, J. H.	1888
Bolio, O.	1888	Long, B. W.	1888
Buchanan, S. C.	1888	Look, J. Q.	1887
Calkins, H. W.	1887	Lumbard, W. D.	1887
Carman, N. F.	1887	McQueen, E. F.	1888
Clark, S. N.	1888	Miller, C. N.	1888
Clark, L. K.	1888	Neff, H. C.	1888
Clark, W. O.	1888	Nowell, W. S.	1888
Dahm, A. C.	1888	Parker, A.	1888
Davis, F. S.	1888	Peacock, C. M.	1888
Davis, G. L.	1888	Porter, W. B.	1888
Demorest, W. M.	1888	Reck, J. A.	1888
Douglass, F. M.	1887	Row, Frank	1888
Dunning, N. A.	1888	Schaller, Joseph	1888
Falk, W. B.	1888	Schenck, C. E.	1888
Forest, G. W.	1887	Share, A. L.	1888
Francis, J. L.	1887	Shaw, B. C.	1888
Frizelle, C. L.	1888	Shaw, S. B.	1888
Gahan, D. J.	1888	Smith, J. F.	1883
Gebhard, A. E.	1888	Stewart, M. W.	1888
Graydon, G. H.	1838	Teetzell, W. H.	1888
Grommon, P. D.	1888	Wasson, J. H.	1888
Hall, J. W.	1888	Weston, Daniel	1888
Hamilton, C. W.	1887	Wheeler, Obed.	1888
Harris, D. S.	1888	Wilkinson, J. L.	1888
Harvey, H. D.	1888	Wilson, A. H.	1889
Hedges, H. C.	1888	Wilson, W. A.	1888
Hendrick, F. H.	1888	Wilson, W. E.	1888
Herrington, C. H.	1888	Withe, A. F.	1888
Hogle, J. L.	1888	Woodward, M. G.	1888

DECEASED MEMBERS.

		ELECTED.	DIED.
Andrus, W. S.	Utica	1883	1886
Cole, L. W.	Petoskey	1885	1887
Coman, L. S.	Bay City	1884	1887
Dunn, G. B.	Burr Oak	1885	1887
Escott, E. B.	Grand Rapids	1884	1887
Escott, L. W.	Grand Rapids	1885	1886
Hipkins, E. S.	Blanchard	1883	1887
Hyde, W. L.	Marshall	1884	1886
Jones, E. L.	Battle Creek	1883	1886
Johnston, Wm.	Detroit	1884	1888
Latimer, R. L.	Jackson	1884	1888
Laubengayer, J. F.	Owosso	1884	1887
Parsons, H. B., Ph. C.	New York	1884	1885
Petrie, J. D.	Kalamazoo	1884	1888
Reed, H. T.	White Cloud	1885	1888
Riebe, Carl	Ann Arbor	1883	1885
Ronnefeld, Theo.	Detroit	1883	1888
Rudolphi T.	Dowagiac	1883	1888
Shepherd, H. T.	Detroit	1885	1885
Weaver, Ezra	Reading	1886	1888

ERRATA.

Page 40.—Theo. Runefeld should be Theo. Ronnefeld. The name of A. L. Green, Lafayette, Ind., should not appear in list of those dropped for non-payment of dues, but should appear in the list of those resigned.

Page 68.—In foot note, last line, for "ther" read "their."

Page 79.—Line 16 from bottom for "Lyon" read "Lyons," and the same correction is to be made wherever his name occurs in subsequent pages without the final "s."

Page 100.—For Theo. Rounefeld read Theo. Ronnefeld.

Page 123.—Line 17 from top for "Tar" read "Bar."

Page 135.—Line 8 from bottom after the word "as" insert "an."

Page 156.—In table of solubility, "pts." should be "parts."

Page 179.—Under Cut 4. for "s. c." read "s. s."

TO THE MEMBERS OF THE ASSOCIATION:—

Your Editor is fully conscious of the fact that this volume ought to have been issued a long time since. The delay has been caused by a variety of circumstances over which, for the most part he had no control, and which were unavoidable. For your very patient waiting he is very grateful, and hopes the finished work will not prove disappointing. Grateful acknowledgement is due Prof. A. B. Prescott for valuable assistance. H. J. B.

ANN ARBOR, April 1st, 1889.

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THE BEST COUNTER SCALE.

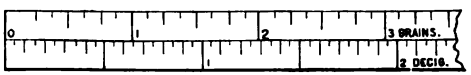
Highly finished in nickel-plated metal and plate glass. 9-inch pans; capacity 20 lbs.; sensitive to 2 grains.



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THE BEST PRESCRIPTION SCALE.

Metal and glass case, handsomely finished. 3-inch German silver pans; with rider beam graduated on upper edge from ⅛ to 8 grains, and on lower edge from ½ centigram to 5 decigrams. Sensitive to 1-64 grain.



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THE TORSION BALANCE has no Knife Edges, Friction, no Wear! Sensitive, accurate, durable. Better than any knife edged balance. The two balances as shown in the cuts are the best for druggists' use. Send for circular showing large variety of styles.

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PENINSULAR FLOOR PAINTS,
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PENINSULAR PERMANENT RED
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PENINSULAR DOMESTIC PAINTS.
MAPLE LEAF PERMANENT GREEN,
BELLE ISLE WHITE LEAD,
PURE PUTTY, WINDSOR WHITE LEAD.

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are offered to the Drug Trade in competition with Eastern markets. We grind and powder our own Drugs from choicest selections, and can therefore guarantee their quality, as well as the reliability of our FLUID EXTRACTS, ELIXIRS, MEDICATED SYRUPS AND FINE PHARMACEUTICAL PREPARATIONS

Orders by Mail a Specialty. We protect the retail trade by not selling to consumers, we fill orders promptly and completely for all goods in our line, and obtain other goods if they are to be had in our market.

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Myrrh Tooth Soap!

THE SECRET OF PEARLY WHITE TEETH!

A PERFECT GEM FOR THE TOILET!

Gives cooling and refreshing taste to the mouth. Recommended by the highest dental authorities. Absolutely pure, containing in a modified form the medicinal properties of Myrrh. It heals Spongy and Ulcerated Gums, Removes Tartar, Preserves the Enamel, and Prevents Decay and Offensive Breath.

Elegantly Mounted for Show-Case Display. The Best Selling Dentifrice on the Market. Sells Itself.

WHAT IS SAID OF IT.

Messrs. Wright & Co.:—The use of your Myrrh Tooth Soap is so rapidly increasing in my practice, and appreciation of its merits so general, I consider it my duty to say a few words in its favor. I have used it for the past year, and find it all you claim for it. Yours truly,
M. V. MATTHEWS,
Chicago.

A gentleman connected with the Detroit Free Press, and suffering from bleeding gums, and soreness of the mucous surfaces of the mouth and throat, informs us that some months since he was induced to try Wright's Myrrh Tooth Soap, and since using it has had no return of the trouble. He says he considers it a most valuable remedy.



Messrs. Charles Wright & Co.:
Gentlemen:—I have been using your Myrrh Tooth Soap for some time, and cannot say too much in its favor.
Respectfully yours,
H. C. PAYNE, D. D. S.
Hamtramck, Detroit, Mich.

Messrs. Wright & Co.:
Gentlemen:—I have used your Myrrh Tooth Soap in my practice, and find it all you claim for it. Yours truly,
H. E. POPE, M. D., D. D. S.
Detroit, Mich.

Messrs. Charles Wright & Co.:
Gentlemen:—I have been using your Myrrh Tooth Soap in my practice, and find it all you claim for it. Yours truly,
H. C. PAYNE, D. D. S.
Hamtramck, Detroit, Mich.

Messrs. Wright & Co.:—The use of your Myrrh Tooth Soap in my practice, and appreciation of its merits so general, I consider it my duty to say a few words in its favor. I have used it for the past year, and find it all you claim for it. Yours truly,
M. V. MATTHEWS,
Chicago.

A Professor of Dental Surgery in the Dental College of the Michigan State University says of it:—"I am satisfied from a careful examination of your Myrrh Tooth Soap that it contains valuable properties to the teeth. I am using it and consider it a most useful article."
J. A. WATLING, D. D. S.
Ann Arbor, Mich., March, 1880.

I have been using your Tooth Soap and find it gives general satisfaction. While passing over this city Dr. Judge, I noticed an advertisement of your preparation, entitled "The Gem of the Teeth." Please send me one gross.
MALCOLM BROOKS,
Fort Huron, Mich.

Gentlemen:—I find after using your Myrrh Tooth Soap for some months, quite an appreciation in cleansing and whitening of the teeth, and a general appreciation of it by the patients in the room.
W. H. BOWLES,
Detroit, Mich.

Gentlemen:—Your Myrrh Tooth Soap is the best I ever used. I recommend it to my patients.
Pendleton, Ind.
DR. J. C. WHITAKER,

Your Myrrh Tooth Soap has given me the best satisfaction. Since I have used it I shall continue to do so in future. I have only used it a short time, but I find it a most valuable preparation.
CHARLES E. BLACKMAN,
Salmon Dept. A. T.

We find the Myrrh Tooth Soap a preparation of merit. Many of our customers speak in the highest terms of it. We shall continue to keep it in stock.
SAMUEL WELLS,
Philadelphia, Pa.

I am better pleased with your Myrrh Tooth Soap than with any dentifrice I have previously used.
THOS. J. DYMAN,
Mgr. Surprise Soap Mfg. Co., Norwich, N. Y.

I use your Myrrh Tooth Soap constantly. It is a good article, and I take pleasure in recommending it to my patients.
L. E. HISEY, Chicago, Ill.

A gentleman using your Myrrh Tooth Soap and my tooth powder, finds it a most excellent article for the teeth.
STEPHEN SIMS, Ypsilanti, Mich.

I take pleasure in recommending your Myrrh Tooth Soap, and think it one of the good qualities you claim for it.
A. S. BUSSELL, Agt. Western Northwest Cross, Des Moines, Iowa.

I consider your Myrrh Tooth Soap the best preparation of the kind with which I am acquainted. I can recommend it, and practice what I preach, by making constant use of it.
JOHN W. YANDELL, M. D.
Capetton, W. Va.

I receive your Myrrh Tooth Soap in fine condition, and will say it is the best article for the teeth, and your Myrrh Tooth Soap sells well. I shall recommend it to my patrons.
DANIEL S. RITCHIE,
Lyons, Mich.

Your Myrrh Tooth Soap is a most excellent article.
BAKER & BUSSERTON, Saratoga, N. Y.

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MICHIGAN STATE



HARMACEUTICAL

ASSOCIATION.

Proceedings Seventh Annual Meeting, 1889.

THE TRUTH ABOUT PEPSIN.

THE competition among pepsin manufacturers for the past year has been so great as to lead to not a little misrepresentation by the less scrupulous as to the actual facts. The controversy over the subject of pepsin tests and standard and comparative digestive power has gradually simmered down to a recognition of certain facts which all physicians should recognize. These may be briefly stated as follows:

Since the last revision of the U. S. Pharmacopœia there has not been a single instance where the remedial value of a preparation has been so greatly enhanced, through the instrumentality of the manufacturing pharmacist, as in the case of pepsin.

This achievement has resulted from the elaborate researches which have been conducted in the department of our laboratory devoted to original work. We have thus been enabled to increase the proteolytic or digestive power of commercial pepsin to a standard forty times higher than that required by our Pharmacopœia, and, at the same time, imparted to our product certain qualities which have been heretofore regarded as verging on the impossible.

Our pepsinum purum in lamellis and pepsinum purum pulvis meet all the requirements of a typical preparation, not only as regards their freedom from toxic substances, but in point of digestive activity as well. Both are capable of dissolving two hundred times their weight of coagulated egg albumen under the conditions of our published test, but should the experience of physicians indicate that a still greater activity is desirable, we are prepared to meet their wants in this direction, as a degree of activity has already been reached by us which is many times that of our present standard.

We supply pepsin in the following forms:

Pepsinum Purum in Lamellis; Pepsinum Purum Pulvis; Pepsin, Saccharated, U. S. P., 1880; Pepsin, Glycerole, Concentrated; Pepsin, Lactated; Pepsin, Liquid, U. S. P., 1880; Pepsinum Purum Tablets, 1 gr., Sugar-Coated.

All information desired by physicians as to our pepsin products, our general line of standard medicinal preparations, pharmaceutical specialties, and latest therapeutic novelties and improvements in methods of medication, will be promptly furnished on request.

NORMAL LIQUIDS.

IN Normal Liquids, which we introduced in 1883, we made the first attempt to meet the requirements of physicians and pharmacists for a uniform and reliable class of fluid preparations of drugs not open to the objections and uncertainty of fluid extracts made by U. S. P. processes.

The standard decided upon for these fluids was the result of long experience in the collection, purchase, examination and analysis of crude drugs with a determination of the amount and character of their active principles. The reliability of normal liquids soon led to their large consumption, and the medical profession have evinced their preferance for them to such an extent as to make them now an established and popular method of exhibiting the toxic and narcotic drugs.

It is believed that the best interests of pharmacy and medicine will not be served unless **these or like preparations are officially recognized.** For concentrated tinctures of a definite strength, the name "normal liquids" appears to be happily chosen, as it implies a definite standard of strength. The list should embrace preparations of the more potent crude drugs, 1 CC. representing 1 gramme of drug of standard strength.

As a step in this direction we have long supplied the following normal liquids:

Aconite Root.	Cinchona Calisaya.	Ergot.	Mandrake.
American Hellebore.	Cocoa.	Foxglove.	Nux Vomica.
Belladona Leaves.	Colchicum Root.	Gelsemium.	Rhubarb.
Belladona Root.	Colchicum Seed.	Henbane.	Stramonian Leaves.
Cannabis Indica.	Conium Fruit.	Ipecac.	Stramonium Seed.

Circulars and reprints of articles on normal liquids and the necessity for a higher standard of accuracy for toxic and narcotic drugs sent to physicians on request.

PARKE, DAVIS & CO.,

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PROCEEDINGS

OF THE

MICHIGAN STATE

PHARMACEUTICAL ASSOCIATION

AT ITS

SEVENTH ANNUAL MEETING,

HELD AT

DETROIT,

SEPTEMBER 17th, 18th and 19th, 1889.

ALSO, THE

Constitution and By-Laws, Roll of Members, Etc.

ANN ARBOR, MICH.:
THE COURIER PRINTING ESTABLISHMENT.
1890.

NOTICE.

MEMBERSHIP.

Blank applications for membership will be furnished by the Secretary upon request.

PROCEEDINGS.

Extra copies of the Proceedings can be obtained of the Secretary at the following prices:

Proceedings of 1883	25 cents.
Proceedings of 1884	25 cents.
Proceedings of 1885	50 cents.
Proceedings of 1886	50 cents.
Proceedings of 1887	50 cents.
Proceedings of 1888	50 cents.
Proceedings of 1889	50 cents.

All the above together $2.00.

N. B.—If you change your residence, if your name or address is incorrectly given in the Membership Roll, or if you learn of the death of a fellow member, please notify the Secretary at once.

The next annual meeting of the Association will be held in Saginaw, Sept. 16, 17 and 18, 1890.

H. J. BROWN, Secretary,
Ann Arbor, Michigan.

Officers of the Association.

1889-90.

PRESIDENT.

FRANK INGLIS.....DETROIT.

VICE-PRESIDENTS.

F. M. ALSDORF.....LANSING.

A. H. LYMAN.....MANISTEE.

JAMES VERNOR.....DETROIT.

SECRETARY.

HENRY J. BROWN.....ANN ARBOR.

LOCAL SECRETARY.

D. E. PRALL.....SAGINAW.

TREASURER.

WM. DUPONT.....DETROIT.

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C. A. BUGBEE.....CHEBOYGAN.

GEO. McDONALD.....KALAMAZOO.

E. T. WEBB.....JACKSON.

J. J. CROWLEY.....DETROIT.

D. E. PRALL.....SAGINAW.

Committees, 1889-90.

TRADE INTERESTS.

H. G. COLEMAN ---------- KALAMAZOO.
E. J. ROGERS ---------- PORT HURON.
L. PAULLY ---------- ST. IGNACE.

PHARMACY AND QUERIES.

A. B. PRESCOTT ---------- ANN ARBOR.
A. B. STEVENS ---------- ANN ARBOR.
F. W. R. PERRY ---------- DETROIT.

LEGISLATION.

F. M. ALSDORF ---------- LANSING.
A. W. ALLEN ---------- DETROIT.
JAMES VERNOR ---------- DETROIT.

ADULTERATIONS.

O. C. JOHNSON ---------- ANN ARBOR.
E. A. RUDDIMAN ---------- DETROIT.
H. W. SNOW ---------- DETROIT.

UNOFFICIAL FORMULARY.

A. B. STEVENS ---------- ANN ARBOR.

EDITOR OF PROCEEDINGS.

H. J. BROWN ---------- ANN ARBOR.

SPECIAL COMMITTEE ON NEW MEMBERS.

D. O. HAYNES, Detroit, Chairman.
JAMES VERNOR, Detroit.
F. W. R. PERRY, Detroit.
F. J. WURZBURG, Grand Rapids.
GUY M. HARWOOD, Petoskey.
C. A. BUGBEE, Cheboygan.
H. B. FAIRCHILD, Grand Rapids.
F. M. ALSDORF, Lansing.
J. G. JOHNSON, Traverse City.
A. H. LYMAN, Manistee.
W. A. HALL, Greenville.
D. E. PRALL, Saginaw.
H. A. BLACKMAR, Charlotte.
F. W. FINCHER, Pentwater.
H. J. BROWN, Ann Arbor.
HENRY MARTIN, Jackson.
T. H. MILLS, Port Huron.
O. P. SAFFORD, Flint.
THEO. TROWBRIDGE, Decatur.
GEO. GUNDRUM, Ionia.

Delegates.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Meeting at Old Point Comfort, Va., Sept. 8th, '90.

DELEGATES.	*ALTERNATES.*
O. EBERBACH, Ann Arbor.	GEO. MCDONALD, Kalamazoo.
A. B. STEVENS, Ann Arbor.	WM. DUPONT, Detroit.
H. W. SNOW, Detroit.	H. J. BROWN, Ann Arbor.
GEO. GUNDRUM, Ionia.	A. S. PARKER, Detroit.
J. E. PECK, Grand Rapids.	C. G. STONE, Detroit.

CONVENTION FOR REVISION OF THE PHARMACOPŒIA.

Meeting at Washington, D. C., May 7th, 1890.

C. W. PARSONS, Detroit. H. W. SNOW, Detroit.

S. E. PARKILL, Owosso.

Michigan State Board of Pharmacy.

GEORGE McDONALD, KALAMAZOO,	Term expires Dec. 31, 1890.
STANLEY E. PARKILL, OWOSSO,	Term expires Dec. 31, 1891.
JACOB JESSON, MUSKEGON,	Term expires Dec. 31, 1892.
JAMES VERNOR, DETROIT,	Term expires Dec. 31, 1893.
OTTMAR EBERBACH, ANN ARBOR,	Term expires Dec. 31, 1894.

OFFICERS OF THE BOARD.

PRESIDENT.

JACOB JESSON ..... MUSKEGON.

SECRETARY.

JAMES VERNOR ..... DETROIT.

TREASURER.

GEORGE McDONALD ..... KALAMAZOO.

MEETINGS.

The regular meetings of the Board, for the examination of candidates for registration will be held as follows:

March 4th and 5th, at Grand Rapids.

June 30th and July 1st, at Star Island.

August 13th, at Marquette.

November 5th, at Lansing.

For any further information apply to JAMES VERNOR, Secretary, Detroit.

MINUTES

OF THE

SEVENTH ANNUAL MEETING

OF THE

Michigan State Pharmaceutical Association.

FIRST SESSION.

TUESDAY FORENOON, SEPT. 17TH, 1889.

The Association was called to order at 10 o'clock by the President, Mr. Geo. Gundrum, who congratulated the Association on the goodly number present, and paid a compliment to the citizens of Detroit for their generous hospitality. After which the Rev. Dr. McCorkle offered prayer.

The Hon. Judge Chipman, Member of Congress from the First District of Michigan, was then introduced and delivered a most graceful and hearty address of welcome, which was responded to by Vice-President Alsdorf.

The bills of the members of the Executive Committee for their expenses in attending a meeting to arrange for the Annual meeting were presented by the Secretary, and on motion of Mr. Alsdorf, were allowed and ordered paid.

Mr. H. W. Snow read a paper on the Assay of Nux-Vomica and its Preparations. (For this and other papers presented, and the discussions upon them, the reader is referred to the second part of this volume. "Answers to Queries," etc.)

The President read a letter from the Illinois Pharmaceutical Association extending greeting and notifying the Association of the appointment of a delegation from their Association to represent them at this meeting. The Secretary then read the following list of applications for membership:

Wm. F. Eberbach, Ann Arbor.	Alfred P. Breitenbach, Detroit.
Wm. D. Church, Detroit.	Harry S. Taylor, Detroit.
George D. Wilcox, Eaton Rapids.	Joseph C. Moeller, Detroit.
Oscar W. Smith, Detroit.	Charlie M. Bross, Jerome.
James E. Weeks, Battle Creek.	Fred H. Piper, Lansing.
Chas. H. Green, Detroit.	John H. Albright, Colon.
Henry Palmer, St. John.	Gustavus S. Frenzel, Mayville.
Frank A. Thompson, Detroit.	Wellington J. Law, Le Roy.
Edsel A. Ruddiman, Detroit.	Frank A. Sanford, Grand Rapids.
Joseph M. Croman, Detroit.	George E. Banister, Utica.
John Kinsley, Manistee.	Arthur B. Clark, Gobleville.
Edwin B. Garrigues, Detroit.	A. B. Collins, Charlotte.
Fred J. McMurtrie, Three Rivers.	Edward R. Jebb, Climax.
Cary W. Vining, Lake View.	John M. Shaffar, Gladwin.
Bert N. Beedon, Detroit.	Arthur S. Rogers, Vassar.
Oscar Lowman, Detroit.	Frederick Steinkohl, Manchester.

Frank E. Smallidge, Detroit.

On motion of Mr. Dupont, the Sec'y was instructed to cast a ballot for their election. Which being done they were declared duly elected.

After the reading, by Prof. Prescott, of several papers, the Association adjourned until 2 P. M.

AFTERNOON SESSION.

At 2 o'clock P. M. the Association was called to order, Vice-President Alsdorf in the chair.

PRESIDENT: The first business on the programme is the President's address. We will now listen to the reading of the address.

PRESIDENT'S ADDRESS.

Fellow members of the Michigan State Pharmaceutical Association: As I extend to you all a most hearty greeting, at this our

seventh annual convention, I recognize many familiar faces which were with us a twelve months ago, and which are as cheery and inspiring to-day as then. With these I am pleased to see the faces of many friends who were not so fortunate as to be present at that time, and some who perhaps have never before enjoyed the privilege of being present at our yearly gatherings. All who have the interest of our profession at heart, are welcome here to-day. Not the least among the delights which characterize these reunions, is the happiness which results from the renewal of old friendships, and the forming of new ones. These, with the knowledge we acquire, and the efforts we initiate to elevate our profession, form a bond of union which should increase as the years go by.

The past year has kept pace in progress and achievements with its predecessors.

We believe that in years gone by business success was more easily achieved than now; on the other hand the advantages and opportunities were never so great as now.

"We of all men should be impressed, by this earnest, progressive and active age, and to succeed we must be up and doing."

"Patience and perseverance are in no calling so necessary as with the pharmacist, and without these he cannot hope to attain success."

"We should have exalted ideas of our profession, if we are what we claim to be, *pharmacists;* related on the one hand to science, and on the other to the prosperity and well-being of society."

"The demands upon us can only be met by being true to our trust, and endeavoring to reach higher excellence, by more careful training."

We must be something more than mere tradesmen! Let us make all such pharmaceutical preparations as we can, testing and improving them and our knowledge at the same time. Then, and only then, will we be absolutely certain of the quality of the preparations we offer for sale. At no time in the past have the opportunities and facilities been so great for making our own preparations.

The legislative session of the past winter was noted for the unusual number of liquor bills considered. We should like to contribute toward building a monument to the *legislator* who will discover a device by which the dram-selling *vendor* of drugs, wrongly called a druggist, might be caught and made to suffer a just penalty for his crime; but we disapprove of any law that will punish the innocent with the guilty; nay, even punishing the innocent the most.

The bill to amend the liquor tax law, which was passed at the last session of the legislature, provided at first for inflicting great injustice upon honest pharmacists. This bill was earnestly contested by our Association throughout the session. The fight was long and the result seemed uncertain, but the victory was won. And again was demonstrated the truth of the saying that "In union is strength." Prof. J. P. Remington said that our success as a State Association is due to our "sticking together."

The members of the legislature were appealed to by letters, and personally by a goodly number of our members.

Particular mention is due the legislative committee; Mr. H. J. Brown, Mr. Eberbach and others; but more especially Mr. Frank Wells, with whom I kept up a correspondence throughout the session.

The following extract from one of his letters may be of interest to you: "As you will observe, it is substantially the present law. The druggists have no reason to find fault with the result of the fight. Those members who were bent on either making the druggists pay the liquor dealers' tax, or submit to humiliation and onerous restrictions and obligations, were bitterly disappointed. It was a victory that the profession may be proud of; and it adds one more to the record of their successes. It is also one more evidence of the influence of combined action, in securing a desired end; a fact that cannot be too strongly urged upon the attention of druggists. The result was due to their efforts in awakening the members of the legislature to an appreciation of the justice of their demands."

Mr. Damon, the author of the "Damon Bill," has been severely censured, for introducing and advocating a measure so destructive of the interests of the honest druggist.

It is but justice to him to say, that many of the worst provisions of this bill were grafted on it by Senator Chapman and some of the ultra members of the liquor committee in the House without the consent of Mr. Damon.

The bill as orignally presented contained very many objectionable features, and before the session closed, Mr. Damon probably regretted that he had not asked the advice of other interested druggists before acting.

The Board of Pharmacy has been able and capable. We may feel justly proud of it.

It is largely owing to its discretion and good judgment, that our pharmacy law has given such universal satisfaction. No complaints come from any source of unjust, or arbitrary rulings.

The candidates at the examinations are so fairly treated, that when they fail, they recognize that it is their own fault. The examinations are plain and practical, and void of technical questions.

With the beginning of the past year the long-looked-for National Formulary appeared.

It is pre-eminently the pharmacist's book, and is the grandest work, excepting the U. S. P. that has ever been placed within his reach. While it contains much of interest to the physician, the greater part of the Formulary, is of use mainly to the pharmacist.

It contains most of the written information obtainable outside of the U. S. P. and as it is now seven years since the publication of that work, the N. F. contains much that a supplement of the U. S. P. would have contained, as well as many valuable formulæ from the German and British Pharmacopœias.

The prescribing of these unofficinal preparations will be much simplified, as they will be of uniform strength.

How long these preparations will continue popular, or to what extent they will be used if not advertised and urged on the medical profession, is of course uncertain, but that it will be an aid to medicine in its larger meaning, if the physician knows what he prescribes, even to the flavoring and coloring material, is certain. It is the pharmacists duty to make these preparations whenever the demand for them will warrant him in so doing, as they are neither difficult nor expensive to prepare.

In making the elixirs the best and freshest material must be obtained or the result will not be satisfactory. The oils that are used for flavorings, even if of the best and freshest, will rapidly deteriorate, unless properly preserved.

Elegant pharmacy has long had an attraction for the average pharmacist, and now he may practice it with as good formulæ as any manufacturer possesses.

We have the right and privilege of being represented at the seventh Pharmacopœial Convention, to be held in the city of Washington on the first Wednesday in May, 1890.

We should elect three delegates and three alternates. The utmost care should be exercised in selecting these delegates, so that we may be represented by the men of greatest learning and ability in our profession, men who are competent to sustain their views in debate and discussion.

The Pharmacopœia of 1880 was, more than any previous pharmacopœia, the work of active, skilled and able men of science, 12 physicians and 13 pharmacists.

The work was essentially different from its predecessors, being much more complete in every respect.

An able commentator speaking of it when it appeared, said, "that it is by far the best Pharmacopœia of the times, and this because it is the result of more labor and research than any other."

The conventions of 1870 and 1880 gave instructions that parts by weight should be adopted. The committee of revision and publication of 1870, found the task so great that they disregarded the instructions, but the committee of 1880, to its credit be it said, did not shrink from this enormous task, but faithfully carried out its instructions.

The conventions of 1870 and 1880 were both of the opinion that all measures of capacity should be abandoned and expressed in parts by weight. Even the committee of 1860, changed certain liquids from measure to weight.

At a meeting of the A. P. A. in Boston in 1875, a committee on the revision of the Pharmacopœia was appointed, consisting of fifteen representative pharmacists. The first recommendation of this committee was "that all measures of capacity be abandoned, and that all substances be weighed and the quantities be given in parts by weight."

There has been a feeling growing against our system of weights and measures, because they are not commensurate.

The committee on revision for 1870 included five tables of the metric system in the list of officinal weights and measures. The committee of 1880 added eight showing the relation of the Metric and U. S. systems.

Also wherever definite expressions of weight were to be used, they were to be expressed in both apothecary and metric weight. The committee chose the metric weights and measures as best for making fluid extracts, and give their reasons as follows; "after much discussion and deliberation they decided to make them measure for weight as heretofore, but to substitute the gramme and cubic centimeter for the troy and fluid ounce, which latter are not commensurate."

The conventions of 1870 and 1880 have been paving the way for the change from our troy and fluid ounce to the system in almost universal use.

We should therefore, I believe, favor the adoption of the metric system, if any change is proposed in the "Parts by Weight" in the Pharmacopœia of 1890.

Some contend that so long as Great Britain does not change her system, we ought not to be less conservative.

Why not lead in this? Did not the U. S. in 1786 adopt the dollar and the decimal system it embodies, for its standard?

We led France by thirteen years. All countries of Europe have adopted the decimal monetary system save England, and there is hope that even she will disengage herself from her pence, shillings and pounds ere the century closes. The adoption of the decimal monetary system is virtually conceding that the decimal system is the best of all systems.

The English fluid measure does not correspond so closely with ours as might be supposed.

Thus the U. S. fluid ounce weighs,	455.7	grains.
British " " "	437.5	"
U. S. pint weighs,	7291.2	"
British " "	8750.	"
U. S. pint contains,	16	fl. ounces.
British " "	20	" "
U. S. gal. weighs,	58.329	grains.
British " "	70.000	"

The metric system will, for a short time, be a little embarrassing to the older practical pharmacists, that have not had the advantage of a pharmaceutical education, but they will have plenty of time to become familiar with it, as it is usually two or three years before the Pharmacopœia appears, after the convention meets. All such will be surprised, when they come to use it, to find how easy and simple it is.

The weights are easily obtained, and any apothecary can make his own, if he chooses.

The coins in daily use may be utilized, if desired.

The familiar nickel weighs five grammes, and measures two centimeters.

The cubic centimeter graduates are just as plenty and nearly as cheap as the ounce graduates.

Is it not time that this Association took action toward checking the proprietary medicine and nostrum evil? Perhaps it will not be a gain financially, if the sale of these preparations is curtailed or suppressed. But we are not only druggists, we are citizens as well. Is it not our duty as citizens to act upon the knowledge we possess, as druggists, of the swindling character of most of these preparations, and of the injurious effects they have upon the health of many of those who use them?

It is the greatest evil in our country, next to the abuse of alcohol.

Kansas has already taken a step in the right direction by appointing a committee to confer with the State Board of Health, to devise some means for abating the evils arising from the sale of nostrums. The practice of advertising these preparations in the various ways resorted to, is despicable.

Mr. R. J. Brown with whom we agree, says, "A law should be put in operation that would regulate the sale of all secret preparations, whether patented or copyrighted, that will prevent the community from being imposed upon, at the expense of life and health."

Such regulation should be under the State Board of Health.

"The apprentice system" is still one of the questions receiving considerable attention. We can serve our day and generation best if we take action and keep apace with advanced thought on this subject. If we take none into our ranks but those whose fitness and education have been approved, we shall be doing the apprentice and the profession a kindness.

I would recommend that either our Committee on Pharmacy and Queries, or a special committee, report some subject of general interest and importance for discussion at our next annual meeting: the subject to be announced at this meeting, or stated in the published proceedings. We might thus awaken an interest in members who do not now take the interest they should in our discussions.

I would also call attention to the fact that there is a falling off in papers and reports by members of this Association, especially since Dr. Lyon's absence. The Michigan School of Pharmacy furnishes us excellent papers, but our proceedings would look better if we had more such papers from active practical members.

If we were not a little modest we would like to say a good word for the School of Pharmacy, however we will say this much, that the older schools of pharmacy are afraid that the example set by our school will be catching, and never lose an opportunity to let their auditors know that the practical experience school is the best and ought to be patronized; but from the standpoint of the student who wishes to get the most for his money, our school certainly offers the strongest inducements. The Michigan School of Pharmacy can show just as good work as any of the practical experience schools, and leads them all in requirements for admission.

We were not represented at the meeting of the State Medical Association last year. I trust steps will be taken at this meeting whereby we may be represented in 1890 at their meeting in Grand

Rapids. Efforts should also be made to have that Association represented at our meeting.

Michigan has been adding to the number of the A. P. A. slowly, until now we have about fifty members. The number should be one hundred at least. When we consider the good work this Association has done and is doing, surely we ought to contribute our mite. It costs but five dollars a year for dues, and the proceedings are well worth that amount. It is only through the National Association that we can accomplish the greater good.

Had it not been for this Association we should not have had so much valuable work done when the convention for the revision of the U. S. P. met in 1880, and it is fair to presume not as good a Pharmacopœia.

The N. F. would probably never become nationalized except for the existence of the A. P. A. and that fact alone is worth several years membership. No membership fee is now required, simply yearly dues.

The question is still an open one, what can we do to induce the many druggists in our state, not members of this Association, to join us and give us their aid in elevating and bettering the profession of pharmacy, which can only be done through united effort.

I would recommend that a committee be appointed to report at our next meeting if there is any way whereby these indifferent or unwilling druggists can be made to assist in keeping up an organization like this.

That committee might also report what legislation is necessary to change the surplus that the State Board of Pharmacy has put into the state treasury, into the treasury of the Michigan State Pharmaceutical Association.

You are to take into consideration the expense, and provide the means for the committees to be elected.

Delegates expenses to Washington will be considerable, and the expenses of delegates to State Medical Association should also be paid.

I am sorry to announce the death of one of our honorary members, S. S. Garrigues. He had been an honored and active member of the A. P. A. for over thirty-three years, was the president of the old Michigan Pharmaceutical Association and belonged to the present Association from the beginning. He worked earnestly and presistently for the elevation of pharmacy, before the druggists and people of Michigan were ready for it; and rejoiced to see the day when the same result was attained by a younger generation.

In conclusion, let me say briefly, that I desire to congratulate you upon the past achievements, present standing and promising outlook of this Association.

I thank you gentlemen for the confidence reposed, and the honor conferred, in electing me your president, and my best wishes and efforts shall ever be for the prosperity and growth of the M. S. P. A.

MR. VERNOR: I move that a committee of three be appointed to whom shall be referred the President's Address, and that the thanks of the Association be tendered to the President for the address.

Mr. Vernor's motion was adopted.

PRESIDENT: I will appoint as such committee Mr. Vernor, Mr. Jesson and Prof. Prescott. The next business in order will be the report of the standing committees. The Committee on Legislation will now submit their report.

MR. JESSON: *Mr. President and Gentlemen*—Five bills to amend the pharmacy law were introduced in the last legislature, none of which were passed. Numerous bills to amend the liquor law were also introduced.

The members of your committee with other members of the Pharmaceutical Association, made a number of visits to Lansing to attempt to stem the tide. No important changes in the liquor bill were secured at the first meeting when the bill was considered by the House, but when the bill was considered by the Senate important concessions were secured, making the liquor law less obnoxious and oppressive.

It has been charged by one of our State papers that when this Association assembled they would undoubtedly expel Mr. Damon for the course he took in the liquor legislation, but I do not think we would wish to do that. Mr. Damon introduced a bill in the House raising the license to $800. Mr. Chapman of the Senate prepared a bill, introduced it in the Senate, and then wanted it introduced in the House in order to get it before the House before it passed the Senate. In order to get some one to father it in the House, it was forced upon Mr. Damon, who made strenuous attempts to modify it, but the House was too rabid and he was unable to do it, and in this way it came to be known as "The Damon bill." The pharmacists of the state are under obligations to the members

of the State Pharmaceutical Association for valuable services rendered for the good of the whole profession, and at their own expense.

When the legislature assembles again in 1891 the same ground will have to be gone over, and it is well to prepare for the fight beforehand. Some druggists are indulging in the sale of liquor by the drink in order to live, ignoring all law, order and decency; by their actions disgracing the whole profession. Something ought to be done to bring the saloon druggists to time. They should be compelled to take out a saloon license, and put up the red card. I have much more respect for a saloon keeper who complies with the law by paying the tax (and that is about the only way in which he does comply with the law) than the druggist, who under the guise of an honorable profession, resorts to the nefarious practice of turning his prescription case and back room into a bar-room. This question is a serious one and caused the legislature considerable trouble and anxiety; the question was, how to reach the saloon druggists without ruining the honest druggists.

On motion the report was accepted.

PRESIDENT: The next business will be the report of the Committee upon Trade Interests.

MR. BASSETT: I have no report prepared to be submitted to-day.

PRESIDENT: The next order of business will be the report of officers. We will now listen to the report of the Secretary.

The Secretary made the following report:

SECRETARY'S REPORT.

ANN ARBOR, Mich.

To the Officers and Members of the Michigan State Pharmaceutical Association:

The proceedings of the last annual meeting were issued April 1st, and copies were sent to all who were entitled to receive them. Complimentary copies were sent to the leading Pharmaceutical Journals, and to prominent members of the profession. The usual number of letters praising and commending the work of the Association were received.

The following is a list of the names of those whose death has

been reported to me since our last meeting, although some of the deaths occurred more than a year ago:

N. P. Blakeslee, of Elmira.
Thos. L. Blakley, of Jones---------- died May 4, '88.
J. A. Crookston, of Grand Rapids---------- " Nov. 20, '88.
Elbridge D. Gibson, of Detroit---------- " Nov. 14, '88.
Samuel S. Garrigues, Ph.D., of Ann Arbor- " May 16, '89.
J. L. Hall, of Chatham, Ont.
J. H. Lonsbury, of Reed City---------- " July 28, '88.
Dr. J. C. Muehler, of Detroit---------- " April 21, '89.
W. E. Short, of Manistee---------- " July 24, '88.
A. S. Wallace, of Prescott, Ont.

In the death of Dr. Garrigues and Dr. Muehler the Association loses two most valuable members. I hope the Association may take action to have a suitable memorial paper prepared in memory of Dr. Garrigues. It seems to me the least we could do for one whose deep and intelligent interest in everything pertaining to the elevation of Pharmacy was an inspiration to all who came in contact with him.

The following have resigned:

Geo. L. Le Fevre,	H. J. Hartz,
H. G. Thompson,	T. Trowbridge.

Under Article IV. of the By-Laws, the following 114 names have been dropped from our roll of members for non-payment of dues. (For list see roll of members.)

Many of these should have been dropped last year, but they were kept on, hoping they would see the "error of their way," but for the most part it has proved a vain and empty hope. Many of them have removed from the State, or gone out of business. So the number who have really lost interest in the Association is much smaller than this long list would seem to indicate.

The meeting of State Secretary's at the A. P. A. meeting at San Francisco was not attended by your Secretary, for which *neglect of duty* he believes the Association will *gladly* pardon him.

The usual complimentary copies of Pharmaceutical Journals have been regularly received. As also copies of various State Association proceedings, which can be seen at the Secretary's desk, if any so desire.

The receipts and disbursements for the year have been as follows:

CASH RECEIPTS.

1888.

For Membership Fees, Dues and Certificates	$559 00
Advertisements	130 00
Sale of Proceedings	2 00
Returned by Jas. Vernor	25 00
	$716 00

DISBURSEMENTS.

1888.

Sept. 6.	To William Dupont, Treasurer		$ 40 00
Oct. 7.	" " " "		1 00
Oct. 3.	" " " "		25 00
Oct. 22.	" " " "		35 00
Nov. 8.	" " " "		5 75
1889.			
Apr. 16.	" " " "		15 00
Apr. 17.	" " " "		25 00
May 6.	" " " "		88 50
May 11.	" " " "		50 00
Aug. 26.	" " " "		1 00
Aug. 31.	" " " "		100 00
Sept. 6.	" " " "		100 00
Sept. 17.	" " " "		94 50
Sept. 17.	" " " "		135 25
			$716 00

The following orders have been drawn:

1888.

1.	Sept.	5.	S. E. Parkill, Salary	$150 00
2.	"	6.	Geo. Gundrum, Traveling Expenses	10 45
3.	"	11.	E. T. Webb, " "	4 60
4.	"	11.	Jas. Vernor, Salary Local Secretary	50 00
5.	"	13.	Jas. Vernor, for Gold Medal for the most instructive Exhibit	25 00
6.	"	21.	Jas. Vernor, for Rent of Hall	50 00
"	"	"	" " " Medal, (returned)	25 00
7.	"	"	The Times Printing Co., Owosso	5 25
8.	Oct.	13.	Calvert Lith. Co., for Certificates	10 00
9.	"	22.	H. J. Brown, for Engrossing "	30 00
"	"	"	" " " Postage	5 00
10.	"	"	H. Whittaker, for Report	75 00

11.	Nov. 5.	Register Printing Co., for Letter Heads		5 75
12.	" "	Detroit Paper Box Co., for Rolls		2 50
13.	" 28.	Duplicate of No. 8, (lost)		0 00
1889.				
14.	May 3.	Cuts for Proceedings		15 00
"	" "	Postage and Express on Proceedings		73 50
15.	" "	J. E. Beal, for Printing "		275 00
"	" "	" " " Circulars, etc.		7 25
16.	" 8.	D. D. Thorp, Lansing, for Printing Memorials to Legislature		12 00
17.	Sept. 17.	H. J. Brown, for Supplies		94 50
				$925 80

Respectively submitted,

H. J. BROWN, *Secretary.*

PRESIDENT: The Association will now listen to the report of the Secretary of the Board of Pharmacy.

Mr. Vernor, the Secretary of the Board of Pharmacy, then submitted his report, of which the following is an abstract:

The Board has held two special meetings during the year, one for the purpose of preparing questions for the examinations, and the other for the purpose of placing the work of the Board before the State Legislature with a view of preventing the passage of measures calculated to nullify the usefulness of this Board.

We have also held the three regular meetings as prescribed by law for examination of candidates, at which we examined 249 applicants for registered pharmacist and 55 for assistant pharmacist certificates, granting 161 certificates for the former and 69 for the latter, the excess of the latter being accounted for by the rule of the Board to grant assistant certificates to those candidates for registered pharmacist who failed to pass a complete and satisfactory examination, yet passing high enough to warrant the Board in issuing them certificates as assistants.

The Board has received and disbursed during the past year as follows:

RECEIPTS.

From	213 applications for examination, registered pharmacist, at $3.00	$ 639 00
"	101 applications for examination, assistant pharmacist, at $1.00	101 00

From 48 renewals of certificates, at $1.40		67 20
" 2670 " " " " $1.00		2,670 00
" 184 " " " " $ .50		92 00
		$3,569 20
Disbursed as per report to State Board of Auditors		2,985 11
Balance on hand		584 09
Balance on hand from last year		802 29
Total on hand		$1,386 38

The Board in its last annual report gave you the number of

Certificates in force July, 1888	2835	230
There have been added during the last year	161	69
Total	2996	299
Dropped during last year	117	47
In force July 7, 1889	2879	252

Many complaints of violations of the pharmacy law have been received and investigated. The larger proportion have proved to have been founded upon personal jealousies and no sufficient evidence could be obtained to warrant prosecution. The Board has caused complaint to be made during the year against nine persons, resulting in seven convictions, one failure, while one case is still pending, making with the cases previously reported nineteen persons convicted of violation of the law since its enactment.

MR. VERNOR: I would say in addition to the report that if there is any person whose name is not in this book who is engaged in the business, he is undoubtedly violating the pharmacy law, and we should be very glad to hear of it. There is no way in which complaints can be made by the Board, except from information derived from outside sources, and if any member will name a person who is doing business in violation of the law, the Board will institute a prosecution if they can obtain evidence sufficient to convict. The name of the party making the complaint will not appear, nor will he be called upon as a witness.

PRESIDENT: What is the pleasure of the Association in regard to this report.

MR. GUNDRUM: I move that the report be received and an abstract of the same be printed in the proceedings.

The motion prevailed.

The Treasurer then made the following report:

TREASURER'S REPORT.

DETROIT, Sept. 18, 1889.

1888. RECEIPTS.

Sept.	4.	To balance on hand				$ 632 98
"	5.	" cash		$ 40 00		
"	6.	" "		1 00		
Oct.	2.	" "		25 00		
Nov.	1.	" "		35 00		
"	9.	" "		5 75		
1889.						
Apr.	17.	" "		15 00		
"	18.	" "		25 00		
May	7.	" "		50 00		
"	"	" "		88 50		
Aug.	28.	" "		1 00		
Sept.	3.	" "		100 00		
"	7.	" "		100 00		
"	17.	" "		219 50		
"	"	" "		10 25		
						716 00
						$1348 98

1888. DISBURSEMENTS.

Sept.	4.	By paid S. E. Parkill,		1	$150 00	
"	"	" " Geo. Gundrum,		2	10 45	
"	20.	" " J. Vernor,		4	50 00	
"	21.	" " "		5	25 00	
"	22.	" " E. T. Webb,		3	4 60	
Oct.	1.	" " J. Vernor,		6	75 00	
"	"	" " Times Printing Co.,		7	5 25	
Nov.	1.	" " H. J. Brown,		9	35 00	
"	"	" " H. Whittaker,		10	75 00	
"	9.	" " Register Printing Co.,		11	5 75	
"	"	" " Detroit Box Co.,		12	2 50	
Dec.	6.	" " Calvert Lith Co.,		13	10 00	

1889.							
May	7.	"	"	H. J. Brown,	14----------	88 50	
"	"	"	"	Junius E. Beal,	15----------	282 25	
"	16.	"	"	D. D. Thorp,	16----------	12 00	
Sept.	17.	"	"	H. J. Brown,	17----------	94 50	
							925 80
				Balance on hand----------			423 18
							$1348 98

On motion the report was accepted.

PRESIDENT: What is the further pleasure of the Association?

SECRETARY: The reports of the Secretary and Treasurer should be referred to the Executive Committee for examination and report. Before that Committee reports, they should examine the reports of the Secretary and Treasurer.

PROF. PRESCOTT: I move that those reports be referred to the Committee as required by our Constitution.

The motion prevailed and the reports were so referred.

MR. BASSETT: We have here formal invitations from Mr. H. C. Parke to a reception to be held at his residence this evening. It is understood that everyone connected with this Association, or with the drug business, is invited to be present. The matter of an invitation is simply a formality.

PRESIDENT: There are now with us four gentlemen from Illinois whom I desire to introduce to the Association. I have the pleasure to introduce Mr. C. S. Halberg, of Chicago, and we would like to hear a word from him.

MR. HALBERG: *Mr. President and Gentlemen:* When we heard that several gentlemen were coming to visit Detroit on the occasion of the opening of the Exposition, it occurred to us we might be attached to that committee and come here and pay you a visit incidentally to our

efforts to boom the World's Fair at Chicago. We are glad to be with you and we only regret that an opportunity is not afforded us every year upon the same conditions as this year. As representatives of Chicago we have come to Detroit to gain as much information as we can with reference to the Exposition, and also if possible to enlist your aid and interest in securing the World's Fair in 1892 for Chicago. If the Michigan State Pharmaceutical Association, to the degree that it represents the interests and desires of the State, would kindly consent to aid us in this undertaking, we should all the more love you and should leave you with most pleasant recollections.

PRESIDENT: I have the pleasure of introducing to you Mr. J. W. Blood, the President of the Chicago Retail Druggists Association.

MR. BLOOD: *Gentlemen of the Michigan Pharmaceutical Association:* This is an opportunity I have looked forward to for the past week with pleasure. We have been very much occupied with our work for the Exposition in 1892, and we have not had much time to talk or think of anything else. We come here to-day and we find that Michigan is with us without a doubt. We have heard from some of your principal men, the Governor and others, who have spoken to us at the Exposition, and as Mr. Halberg said, we are here for a purpose, we are here on business, and we shall be pleased if we can get your co-operation to assist us in locating the World's Exposition for 1892 in Chicago.

MR. GUNDRUM: I now have the pleasure of introducing to you Hugo Martin, Secretary of the Illinois State Pharmaceutical Association.

MR. MARTIN: *Mr. President and Gentlemen of the Michigan State Pharmaceutical Association:* These gentlemen have stated about what we came here for, and I can assure you that I came here anticipating a great deal of pleasure, and I have realized it.

The Illinois Pharmaceutical Association sends its greeting to the members of the Michigan Association. We have one of the largest associations in the United States, and our meetings are pretty well attended.

PRESIDENT: I have the pleasure of introducing to you Mr. A. Scherer, of the Illinois Pharmaceutical Association.

MR. SCHERER: My friends at the right have said about everything that I know of that could be said, so I must beg to be excused.

MR. GUNDRUM: We are very much pleased, gentlemen, that you have paid us a visit. Our numbers are small this afternoon because our members have gone to the Exposition. We will be pleased to have you come in as often as you can while you stay in Detroit, and take part in our discussions.

SECRETARY: These gentlemen in their remarks have asked for the moral support and good will of the Michigan State Pharmaceutical Association, to aid in securing the World's Fair at Chicago. I suppose the question of where the World's Fair is to be held lies between Chicago and New York, and I fancy that the residents of Michigan as a rule would prefer to have it held in Chicago. I know these gentlemen would be disappointed if we should fail to respond to their eloquent appeals for aid. I therefore move that it is the sense of this meeting that the people of Michigan should favor the location of the World's Fair in Chicago.

MR. DUPONT: I support the motion.

The motion prevailed.

MR. HALBERG: The record of the Michigan Pharmaceutical Association is one of work, and it certainly has been demonstrated in this instance, for actions speak louder than words. I can only say that you quite overcome us with this rapid and pleasant action, and we shall feel under lasting obligations to you for it.

SECRETARY: I would like to ask the Secretary of the Illinois Association a question in regard to their Association. Have you adopted the plan of making every registered pharmacist in the State a member of your Association?

MR. MARTIN: I would answer that we have. It is hard to judge at this time how much of a success it has been. Our attendance this year was about the same as on previous years, but we see no objection to making every registered pharmacist of the State a member of the Association, and I really believe that in time it will add good working members to the Association.

MR. BASSETT: What is your method of making them members?

MR. MARTIN: Nothing further than to enroll each druggist as a member of the Association. The Illinois Pharmaceutical Association is recognized by the State law as an Association.

MR. BASSETT: You do not get any fee out of them?

MR. MARTIN: We do indirectly. There is an annual due of $1.50 that we pay into the treasury of the Board of Pharmacy, and the treasury of the Board of Pharmacy pays all expenses of the meetings. That is a State law.

MR. BASSETT: That holds good in your courts, does it?

MR. MARTIN: The law says that the expenses of the Illinois Pharmaceutical Association shall be paid in that way.

MR. BASSETT: What do you do with the balance of money?

MR. MARTIN: It is held in trust by the Treasurer of the Board until the amount of $2,000 is reached, and any amount over that is turned into the State treasury.

MR. BASSETT: What do you do in prosecutions for violations of the pharmacy law?

MR. MARTIN: They are conducted by the board and paid out of the general fund.

MR. HALBERG: One-half of the fines, which are usually $50, go to the school district in which the prosecution is made, the other half just about defrays the expenses of the prosecution; so that while 104 prosecutions were made in the year 1888, the receipts and expenditures connected with the prosecution just about balanced. We have now in Illinois linked together the Board of Pharmacy and the Association in a very compact way. Heretofore it was continually charged that the members of the Board of Pharmacy were selected by a clique. Whether that was true or not, the charge was made and is made in nearly all State Associations. Now, we did away with that by having each registered pharmacist in the State vote for three names out of a list of twenty-five names, one from each Congressional district in the State and five names at large, sending them into the Secretary. At our annual meeting our Secretary reports who has received the larger number of votes and the three receiving the largest number of votes are declared the choice of the Association, and those three names are sent to the Governor to be selected from. We think in that way we will eventually do away with any objection that may arise to the former method of selecting candidates for the Board of Pharmacy. We interest every pharmacist in the State after he is registered, and while he is yet an assistant we enlist him in the Association, and if he wants to attend it he is in as good a position as any one else. The only practical difficulty that stood in the way was that regarding the revenue necessary to defray the expenses of the Association. But in passing the last amendment to the Pharmacy Bill, which took effect on the 1st of last July, we succeeded in incorporating a clause by which the Association is virtually recognized by the State, and after the expenses of the Board of Pharmacy are defrayed the

remainder can be further expended to meet the expenses of the Pharmaceutical Association.

MR. BASSETT: You have never had the question of the constitutionality of the law brought before the courts, have you?

MR. HALBERG: No.

PRESIDENT: I would say in answer to Mr. Halberg that while I have not a very thorough knowledge of the workings of the Illinois Pharmaceutical Association, I had in view what he has spoken of in recommending the appointment of a committee to report at our next annual meeting upon the matter he has referred to. I am glad that Mr. Halberg and the other members from Illinois have given us so much light on the subject.

PROF. PRESCOTT: After the full establishment of a pharmacy law in any State the relations between the Board of Pharmacy and the State Association in their work is a very close one, and it is a relation that will have to be worked out according to experience. In each State, I believe, a State Pharmaceutical Association was organized before a law was obtained. Laws have been secured only by the work of the societies, so that in the beginning a State Pharmaceutical Association must have its organization entirely independent of registration. It is an experiment to make the registered pharmacists of the State to be ex-officio members of the State society, this society to be recognized by law. It is an interesting experiment.

PRESIDENT: What is the further pleasure of the meeting?

MR. VERNOR: The Committee on the President's Address beg leave to report that we have examined the suggestions and recommendations contained in the address, and suggest that:

1. This Association appoint three members and three alter-

nates as representatives from this Association to the Convention for the Revision of The National Pharmacopœia, to be held in the City of Washington in May, 1890.

2. That the Secretary of this Association be instructed to call the attention of the Ann Arbor School of Pharmacy, the Medical Department of Michigan University, the Detroit Medical College, and, if incorporated, the Michigan Medical Association, that they are entitled to a similar number of delegates at that convention.

3. That the following be declared the sense of this meeting:—

Resolved, That we endorse the metric system, and recommend the furtherance of its use whenever practicable.

Resolved, That in the sale of proprietary articles this Association recognizes a growing evil that menaces the health of the community at large, and recommend that their sale and use be discouraged upon every possible occasion.

4. That a committee of twenty be appointed on membership, whose duty it shall be to devise and carry out a plan to increase the membership and interest in the work of this Association.

The President's suggestions in relation to defraying the expenses of delegates from this Association to the conventions in Washington and elsewhere do not meet the approval of your committee, who cannot but feel that the honor of such an appointment should be sufficient to offset any expense that might be incurred.

Your committee desire to congratulate the Association on the scholarly and able address of its President, and find in it only another instance of the right man in the right place.

JAMES VERNOR,
JACOB JESSON,
ALBERT B. PRESCOTT, } Committee.

MR. BROWN: I move the report of the Committee be accepted, and that it be taken up for discussion at some future time.

Carried.

On motion the Association took a recess until Wednesday morning at 9 a. m.

SECOND DAY.

FORENOON SESSION, SEPT. 18, 1889, 9 A. M.

At this hour the Association was called to order by

the president, who announced the election of officers as the first business.

PROF. PRESCOTT: I move that the election of officers be passed for the present.

Two thirds of the members voting for the motion, the election of officers was postponed.

PROF. PRESCOTT: We might fill in the time with some of the questions from the question box. A member not present addresses this note: "I enclose clipping for question box, which, if not too lengthy, have read and commented on, as I think the time has come to put a check on the too liberal use of our names as respectable druggists." The clipping is taken from the *Western Druggist* and reads as follows:—

"About a year ago the advertisements of a patent medicine house of your city, in a local paper here, became obnoxious and untruthful, and that, as said advertisements used my name as a dealer in their nostrums, I, by card in same paper, denied the statements made in their advertisements and told the public I was not authority for them. Again recently I noticed a similar advertisement in the same paper, of which the following is a sample:

"MERIT WINS.

We desire to say to our citizens that for many years we have been selling (several nostrums here named) and have never handled remedies that sell as well, or that have given such universal satisfaction. We do not hesitate to guarantee them every time, and we stand ready to refund the purchase price if satisfactory results do not follow their use. These remedies have won their great popularity purely on their merits.—B. F. Buchanan, Harrisville."

MR VERNOR: I think the gentleman has recourse to the law against any one using his name in that way. I don't think it would be healthy for anybody to forge an affidavit of mine in that shape.

PROF. PRESCOTT: I am inclined to think, Mr. President, that it is a common thing for the names of pharma

cists to be taken in the making up of advertisements, without consulting the pharmacists, and pharmacists often let it go by default, though certainly it is a custom that would be more honored in the breach than the observance. Now, the real position of the pharmacist in respect to the sale of nostrums and patent medicines is a very strong position, one that cannot be assailed. It is this: That it is the duty of the pharmacist to furnish the public such remedies, or such articles offered for remedies, as the people in good faith may call for and desire to use. The people themselves are to make choice of remedies, or of physicians, pharmacists being especially forbid to judge as between one remedy and another. Men have the right to take care of their bodies in their own way as they have the right of personal faith in the care of their souls; an individual right inherent in the political system of this country. The *sale* of nostrums by the pharmacist ought not to be complained of. If the public want them they have the right to have them and use them. But when the pharmacist becomes an adviser, the case is very different. The giving of medical advice is something which pharmacists avoid, as far as they can. Nevertheless, by inattention, they permit the advertiser of a secret remedy to bring their names in the public prints with implied or direct recommendation of its indiscriminate use.

MR. EBERBACH: This subject is entirely new to me. I have to acknowledge that I have never paid much attention to these forms, or to the reading of these advertisements and have never had the idea that any of them would have the appearance of an endorsement. I have always looked upon the matter as a notification as to the place where the articles could be had, provided the public wanted them, but if they are used in this way, and as an endorsement, I think the members of the Association ought to give a little more attention to the matter and see that they are not put in that shape.

PROF. PRESCOTT: Of course very often the name of the pharmacist is given only to show the place of business the articles can be found, and there is no real objection to that, and I do not refer to that at all, but to the publication of an assumed recommendation of the article by the pharmacist.

PRESIDENT: We will proceed with the regular order of business—the election of officers. Nominations for President are in order. I will appoint as tellers Mr. Inglis, of Detroit, and Mr. Harwood, of Petoskey. As there are no nominations we will proceed to an informal ballot for President.

The ballot was taken and the tellers reported as follows: The total number of votes cast is 62. Mr. Alsdorf receives 19, Mr. Lyman 16, Mr. Gundrum 5, Mr. Vernor 8, Mr. Inglis 8.

The president here retired from the chair and called upon Vice-President Dean, of Niles, to preside.

PRESIDENT: We will now take a formal ballot.

MR. INGLIS: I am not a candidate for the presidency. I appreciate the honor very much, but I have got to go around and take up the ballots and I hate to take them in my hat.

MR. BASSETT: There is no man who makes so good an officer as the man who doesn't want it.

PRESIDENT: I think the office should seek the man, and not the man the office.

SECRETARY: There are a good many in the hall who have not registered and I should like to have them do so. We have only about half the names of those present, and we would like them all.

PRESIDENT: The tellers will announce the ballot for President.

MR. HARWOOD: The total number of votes cast is 65,

of which Mr. Inglis receives 36, Mr. Alsdorf 19, Mr. Vernor 7, Mr. Lyman 3.

PRESIDENT: Gentlemen you have made choice in Mr. Frank Inglis, and he is your President for the next year.

MR. INGLIS: I certainly had no idea that any of my friends intended giving it to me. All I can say is that I appreciate the compliment very much. I am sorry for the Association, but if you will elect some good Vice-Presidents I will try and do the best I can.

PRESIDENT: I will say to Mr. Inglis that I think this Association is willing to trust him.

MR. GUNDRUM: I move that the three persons receiving the highest number of votes cast for Vice-President shall be declared elected in the order of the vote; that is, the one receiving the highest vote being first Vice-President, and so on.

The motion prevailed.

MR. STEVENS: I would nominate Mr. Alsdorf for Vice-President.

Mr. Kephart, Mr. Vernor, Mr. Lyman and Mr. Northrup were also put in nomination for Vice-Presidents.

MR. NORTHRUP: I would like to request any who may have my name in view to vote for Mr. Alsdorf, my fellow-townsman.

PRESIDENT: This is a formal ballot.

The ballot being concluded, the tellers made the following announcement of the vote on Vice-Presidents.

MR. INGLIS: Mr. Alsdorf receives 39, Mr. Lyman 35, Mr. Vernor 31, Mr. Kephart 22, Mr. Northrup 6. Scattering 6.

PRESIDENT: What will you do with the report of the tellers?

MR. NORTHRUP: I move that Mr. Alsdorf, Mr. Lyman

and Mr. Vernor be unanimously declared elected as Vice-Presidents.

The motion prevailed and they were declared duly elected.

PRESIDENT: Are there any nominations for Secretary?

MR. GUNDRUM: I nominate Mr. Brown.

A MEMBER: I nominate Mr. Bugbee. of Cheboygan, for Secretary.

MR. GUNDRUM: As there are only two candidates nominated, I move that this be a formal ballot.

The motion prevailed.

PRESIDENT: Mr. Bassett informs me that Mr. T. H. Hinchman and Mr. J. S. Farrand, old druggists of Detroit, and known perhaps to every druggist in the State, are present with us, and I have no doubt that the Association would be pleased to hear from them at this time. I have the pleasure of introducing Mr. Hinchman.

MR. HINCHMAN: *Mr. Chairman and Gentlemen:* We will take but a very few moments of your time. Mr. Farrand and I have been particularly requested to represent the National Wholesale Druggists Association at this meeting, and I will only take time to convey to you their wishes for your advancement and prosperity, and to invite you cordially to send a delegate or delegates to their convention to be held at Indianapolis on the fourth Tuesday in October. There will be half-fare, so it will cost your delegates very little to attend.

I will add that there have been no particular interests connected with the Wholesale Association during the last year, except some discussions of laws against trusts, and some discussions of what is known as the rebate or contract plan, and also the matter of fire insurance, and those undoubtedly will be the principal topics considered at Indianapolis. If this Association has any communication or recommendation which they would like to make to that

Association, the Association will be extremely happy to hear from you and receive your requests.

PRESIDENT: I have the pleasure of introducing to the Association Mr. J. S. Farrand, who is so well known to you that he scarcely needs an introduction.

MR. FARRAND: *Mr. President and Gentlemen:* I can only say that I hope you will have a pleasant and profitable meeting while you are here. I always have my Brother Hinchman with me to do all the talking and he always convinces, entertains and instructs his audience whenever called upon to do so.

PRESIDENT: We will now listen to the report of the tellers.

The tellers reported that the total number of votes cast for Secretary was 63, of which Mr. Brown received 31, Mr. Bugbee 31, Mr. Alsdorf 1.

MR. GUNDRUM: I move that we proceed to another formal ballot.

MR. BUGBEE: I move that we dispense with the formal ballot and that H. J. Brown be elected our Secretary for the ensuing year.

MR. GUNDRUM: It cannot be done that way. It has to be done by ballot.

MR. VERNOR: To facilitate the work, I move that the President be requested to cast the ballot for H. J. Brown for Secretary.

PRESIDENT: The motion was for a formal ballot, which was supported, and unless that is withdrawn we cannot accept this motion.

The original motion was then put and lost.

MR. VERNOR: I renew the motion that the President be authorized to cast the ballot of the Association for Mr. Brown.

The motion prevailed and Mr. Brown was duly elected Secretary.

PRESIDENT: The next business is the election of a local Secretary.

MR. GUNDRUM: We do not elect a local Secretary until the place of meeting is decided upon.

PRESIDENT: Nominations for Treasurer are in order.

MR. INGLIS: I move that the Secretary be instructed to cast the ballot for William Dupont for Treasurer.

PRESIDENT: If there is any member of the Association who desires that we should proceed to a ballot for the office of Treasurer, we will do so. If there is no other nomination I will put the motion.

There being no other nomination the motion prevailed and Mr. Dupont was elected Treasurer.

PRESIDENT: There are five members of the Executive Committee to be elected, how will you elect them?

MR. GUNDRUM: I move that we proceed to a formal ballot for members of the Executive Committee, all to be elected upon one ticket.

MR. STEVENS: I nominate as a member of the Executive Committee Mr. Bugbee.

Mr. J. J. Crowley, Mr. Prall and Mr. Wells were also nominated.

PROF. PRESCOTT: While we are waiting we might as well open the question box. I have a question here, "What change takes place when borax, bi-carbonate of soda, and glycerine, are mixed?"

MR. SNOW: Just what the bi-carbonate of soda would effect is in doubt, but glycerine liberates the acid from the borax. I cannot see how the bi-carbonate of soda would effect it. It is likely that a reaction between the boracic acid and the glycerine would take place.

PRESIDENT: Perhaps the gentlemen who dropped the question in the box might make a statement of the result which he found to be produced.

MR. WALKER: The action which does take place with very many samples of glycerine is an effervescence, and that is probably what is referred to. That I should judge to be due in a good many cases to the acidity of the glycerine used and the action that would take place between the glycerine and the bi-carbonate of soda. It does effervesce in some cases and under the same conditions I have never observed any variation of result.

PROF. PRESCOTT: Of course conditions of dilution would be important.

MR. STEVENS: I doubt very much whether there is enough acid in the glycerine to account for the change that takes place. If due to the acidity of the glycerine, the effervescence would be obtained without the borax. If you mix borax and carbonate of soda there is no change, but when you mix the three together, then the change takes place and there is a strong liberation of carbonic acid, greater than would be due to an acidity of the glycerine. Of course, the difference between one mixture and another may be due to the elevation of the temperature in certain cases, but I think without doubt there is a combination between the radical of the glycerine and the boracic acid.

PROF. PRESCOTT: Here is another question. "Pharmacy laws have been introduced into three-fourths of the States and the time is approaching for a revision of the Pharmacopœia. Would it not be appropriate to take steps to secure some enactments by Congress to make our Pharmacopœia a legal standard for the United States?"

MR. DUPONT: I had supposed that when the government furnished medical talent through its army corps in preparing the Pharmacopœia, that that was really an acknowledgement of our Pharmacopœia as being legal, and that it would give it recognition in our courts.

PROF. PRESCOTT: By certain laws of the United States

and certain laws of the Revenue Department and by certain laws of the States, certain individual standards of the Pharmacopœia are recognized and adopted. The quality of certain articles admitted under the customs laws and regulations is defined by adoption of the standard of the U. S. Pharmacopœia. In fact, it is a general provision of laws governing the adulteration of drugs that if they are pharmacopœial drugs the standard of the Pharmacopœia shall be adhered to. Further than this I do not know that we have any recognition of the Pharmacopœia by the government. The implied recognition alluded to by Mr. Dupont, might be cited in court, but this falls short of explicit authorization. A petition to congress on this subject might be presented from the American Medical Association, or the American Pharmaceutical Association, or both, and such petition might be made as well after the next revision as before. It might be made at any time.

MR. DEAN: I do not see of what special advantage it would be to the pharmacists of Michigan to have it recognized any further than it is. In suits in the courts, I think, the Pharmacopœia would be accepted.

MR. HALBERG: This question was discussed at the meeting of the Illinois Association a couple of weeks ago, and the desirability was pointed out of having the Pharmacopœia made a real legal standard, and a committee was appointed from our Association for the purpose of furthering this object. I think it would be very desirable to try and have an act passed by congress by the time the Pharmacopœia is revised, making it a legal standard. The government now recognizes it in its dealings with opium and other things, and there is no question but such a law would nationalize the Pharmacopœia, and possibly also indirectly add to the standard of pharmacy throughout the country.

PRESIDENT: We will suspend the discussion for the present and listen to the report of the tellers.

MR. INGLIS: The vote for members of the Executive Committee is as follows: Mr. Bugbee 30, Mr. Prall 20, Mr. Webb 19, Mr. McDonald 14, Mr. Wurzburg 13, Mr. Vernor 13, Mr. Crowley 13, Mr. Wells 11, scaltering 18.

MR. CALDWELL: I move that Mr. Crowley be selected as the choice of the three who are tied on 13.

The President put the motion and Mr. Crowley was duly elected the fifth member of the Executive Committee.

PROF. PRESCOTT: I now move that the five who have received the highest number of votes be declared elected. Carried.

MR. GUNDRUM: I move that this Association hold its next meeting at Bay City.

MR. ANDERSON: It seems to me that Saginaw is a better location for the meeting than Bay City, and I move to substitute East Saginaw for Bay City.

MR. GUNDRUM: I wish to include in that motion the date of the meeting, and not knowing of any better date than this time of the year, I move that the third Tuesday in September be selected.

PRESIDENT: The amendment is that we meet at East Saginaw on the third Tuesday of September next.

The amendment, being put to a vote, prevailed.

Vice-President Alsdorf was then called to the chair.

CHAIRMAN: Miscellaneous business is in order. We will now listen to the report of the Executive Committee.

The report of the Executive Committee was then presented and accepted.

REPORT OF EXECUTIVE COMMITTEE.

To the President, Officers and Members of the Michigan State Pharmaceutical Association.—The Executive Committee have held only one meeting during the year past, on the 26th of July, at Detroit, at which were present Messrs. Hall, Wurzburg, Bassett and Lyman.

It was thought best to call a special meeting of the Association to change the date of our annual meeting from the 10th to the 17th of September.

The programme was arranged and details were left to the local Secretary, who was also authorized to employ a stenographer and engage a place for our meeting on the 17th of September.

The bonds of the Secretary and Treasurer were fixed at $1,000 each, and approved and placed on file with the chairman of the Executive Committee.

It was decided not to make any exhibit this year.

Your committee have examined the books of the Secretary and Treasurer and found them correct.

Respectfully submitted.

A. H. LYMAN,
F. J. WURZBURG,
E. T. WEBB,
A. BASSETT.

PRESIDENT: We will now proceed to the selection of delegates to the A. P. A.

The following were then selected as delegates to the A. P. A.: Messrs. Eberbach, Stevens, Gundrum, Peck, Snow.

And as alternates, Messrs. Parker, McDonald, Dupont, Brown and Stone.

On motion the president was authorized to appoint delegates to the Pharmacopœial Convention.

On motion Mr. Bassett was elected delegate to the meeting of the National Wholesale Druggists' Association, to be held at Indianapolis.

On motion Mr. D. E. Prall, of East Saginaw, was elected local Secretary for the ensuing year.

On motion of Mr. Vernor the President was directed to appoint delegates to the different State Pharmaceutical Associations for the coming year.

PRESIDENT: The next business in order is the report of the Committee on Adulterations.

Prof. Johnson submitted the following report of the committee:

[The "copy" for the report not having reached us in time to be inserted here, it will be found under the caption of "Answers to Queries, and Volunteer Papers," elsewhere in this book.—EDITOR.]

PRESIDENT: What will you do with the report?

On motion the report was accepted.

MR. SNOW: I have a few reports in connection with the report of the committee, which I desire to submit. The committee is indebted to Parke, Davis & Co. for a report on some of the rarer drugs, which have come recently into market, in regard to their purity, etc., of which the following is chiefly important.

REPORT OF THE COMMITTEE ON ADULTERATION.

Your committee desires to express its opinion that there is very little adulteration, in the most common acceptation of this term, practiced in the line of regular drugs or galenical preparations. That is, there is little reason to believe that in these lines of goods there is much sophistication practiced by the actual addition of cheaper materials to more expensive materials for the purpose of increasing profit. It is true however that much adulteration of this kind is practiced or is believed to be practiced in essential oils, wines and other liquors which are on the border line of pharmacy and which offer unusual temptation with comparatively little fear of detection. However if we give to adulteration its widest scope, viz., any substitution wilful or otherwise of one substance for another, any addition of a cheaper substance to one more expensive for the purpose of increasing profit, any debasing of the quality by careless or ignorant manufacture or collecting, any wilful withholding of expensive material from anthoritative formulas or from formulas where from legitimate inference they may reasonably be expected to be found, etc., there is greater reason for vigilance. Particularly does it seem necessary to guard against the careless or ignorant preparation. Your committee desires to acknowledge the courtesy and assistance rendered them from the laboratories of the School of Pharmacy, and of Messrs F. Stearns & Co., and Parke, Davis & Co. of Detroit.

REPORT FROM THE LABORATORY OF F. STEARNS & CO.

CAFFEINE HYDROBROMATE.

The existence of a true hydrobromate of caffeine has been questioned but without sufficient reason. Several manufacturing chemists supply the genuine salt and one of your committee has had occasion to prepare it on a number of occasions. It occasionally happens,

though without any justification, that buyers will receive the alkaloid labeled hydrobromate. There is a difference in price considerably in favor of the hydrobromate and all buyers should insist on receiving the genuine article. When the true hydrobromate has once been seen there will be no danger of mistaking the alkaloid for it. In addition a seemingly true hydrobromate is offered in an amorphous pink powder. It is however better to use the salt which comes in distinctly crystalline colorless plates free from tendency to the green. Crystals of pinkish tinge are often obtained.

CAFFEINE VALERIANATE.

This article as supplied is very apt to contain less valerianic acid and more caffeine than the composition of the normal valerianate calls for. We have noted this to be the case in a few instances. It is doubtful in our own minds whether a true valerianate of caffeine is regularly offered to the trade though its existence is highly probable.

CAFFEINE CITRATE.

It still happens that caffeine alkaloid or caffeine with variable amounts of citric acid ground in to it and not existing there as true citrate is still offered the trade as we have had occasion to note on several occasions. One interesting fact noted in connection with this salt is that when dissolved in water it precipitates acetate of lead solution at least if the quantity of water is not too large and too much time is not allowed to elapse between the solution and the testing. This fact is incompatible with the statement sometimes made that the existence of a salt of caffeine and citric acid is impossible in the presence of water and doubtless could be made by further experiment the base of a test for the true salt and make a quantitative test unnecessary.

CAFFEINE ARSENIATE.

Caffeine arseniate has been highly recommended as an antiperiodic. It finds use in the French dosimetric granules and is occasionally called for in America. Examination shows that the salt supplied when the arseniate is called for often contains no arsenic at all or deficient and variable amounts.

ADONIDIN.

The adonidin supplied most largely in America during the past few years is very impure, being contaminated with extractive and coloring matter it is practically impossible to obtain a pure article. Even the best is poor.

INSECT POWDER.

The Persian and Dalmatian insect powder is grossly adulterated with a variety of materials. There is almost no pure insect powder to be had, as cheap and "close buyers" have, through their policy, made it impossible for a pure article to compete with the commercial product. One of the most recent adulterants is the Hungarian Daisy, large amounts of which are imported expressly for use as an adulterant.

POWDERED EXTRACTS.

There is no reason to suspect the adulteration of powdered extracts but there is every reason to suspect their quality as offered to the trade. Without proceeding into details regarding any one article suffice it to say that in the examination of samples of powdered extracts of aconite root, belladonna root and leaves, nux vomica, opium, cinchona and cannabis indica a great variation was found in their quality and while a good powdered extract can be obtained the buyer should only purchase from the best and most reliable sources.

OPIUM.

Owing to the regulations of the customs authorities and the strict supervision which is kept over the importation of opium it so happens that pharmacists have in the past been pretty well protected from poor opium. It is however now announced that a sophistication is now being perpetrated after the opium has passed the custom houses and that much opium is being sold which contains only four or five per cent. of morphine instead of nine per cent. as required by the regulation of the custom authorities. All pharmacists should beware of cheap opium and cheap tinctures. Pay the price and take the best.

BEESWAX.

The adulteration of beeswax with paraffin still continues though the detection of the adulterant is a comparatively simple matter. Carbonize about five grammes of the suspected article with 50 c. c. of strong sulphuric acid, wash thoroughly with water, dry and extract with ether. On evaporating the ether the paraffin is left behind in a state of comparative purity.

AMBERGRIS.

We wish to call attention to a very daring attempt at fraud in this product. Whether others have had a similar article offered them to that which was shown us we know not but it is quite possible that such is the case. The sample was simply a colored bees-

wax slightly impregnated with ambergris. The attempt however is too clumsy to be successful.

HEAVY CALCINED MAGNESIA.

An exceptionally fine appearing article purporting to be heavy calcined magnesia was offered to buyers some little time ago which upon examination was found to consist of calcium sulphate. Buyers should be on their guard against a repetition of this trick as it is needless to say there is no therapeutic similarity between calcium sulphate and magnesia oxide. Magnesia, heavy calcined, seems usually to be of very good quality.

VANILLIN.

The gross adulteration of this agent with benzoic acid has been repeatedly noticed by us. In fact it is difficult to obtain an article which is pure and the careless buyer is almost sure to be imposed upon. The adulterant is easily detected by the difference in the appearance of the crystals, by their different melting points, but best by warming with magnesium ribbon and sulphuric acid which develops in the case of adulteration the well known odor of oil of bitter almonds.

IRON AND QUININE CITRATE.

Seven samples assayed by the Pharmacopœial process showed respectively 11, 8.45, 12.15, 12.25, 14.55, 10.55, 8.3% of quinine. The Pharmacopœia requires the salt to contain 12%. The samples however all contained ammonia and were therefore not the U. S. P. article but the soluble form demanded by buyers, though by inference 12% quinine would be assumed. These figures are somewhat better than many have reported, though the extremely low amounts of quinine claimed to be found in some samples is greatly to be doubted. There is reason to believe that discolored and amorphous quinine is often used in this scale salt though this has not yet been mentioned.

QUININE ARSENIATE.

This newer salt of quinine has found considerable use in Europe in granule form and is gaining in favor in America. Messrs. Champigny and Choay (Jour. Pharm. Chim.) report the examination of six samples which were found to contain from 58 to 74 per cent. of quinine, 21.8 to 35.7 per cent. arsenic, and 2.5 to 9.9 per cent. of water. Users of this article in America should therefore buy with caution.

QUININE SULPHATE.

The U. S. Pharmacopœia would in spirit exclude from use all

quinine exceeding 1% of foreign alkaloids. The test applied is that originally recommended by Kerner but this eminent quinologist has since withdrawn it and it has been shown that the conditions of the quinine market and the sources now used for the alkaloid has altered its value as an assay process. Further, at the best, the proportions and conditions of the test would allow quinine containing fully 7% foreign alkaloid to pass muster and so it would seem we have been using a quinine which while seemingly quite pure was in reality much less so. The British Pharmacopœia allows the use of quinine containing 5% of foreign alkaloid and in our opinion this is better. So small an amount of cinchonidine as this cannot appreciably alter the therapeutic value of quinine sulphate. Discarding the U. S. P. process of assay and adopting newer and better processes, fourteen samples were examined representing German, English, French and American products. The highest portion of foreign alkaloid calculated as cinchonidine sulphate was 10.1%, the lowest 4.3%, and the average 7.3%. It was also found that every sample which was examined for it contained as an impurity the new alkaloid announced by Hesse, viz., Hydroquinine. The proportion of water of crystalization was also in all cases less than is permitted by the Pharmacopœia.

Messrs. Paul & Cownley have recently published a paper (Pharm. Jour. and Trans.) on the quality of quinine sulphate of commerce. Both gentlemen are well acquainted with the subject and their report still further confirms the experience that there is a very considerable amount of quinine on the market running 5% and over of cinchonidine, notwithstanding the strenuous efforts of a well-known German quinologist to promote the opinion that there is much more quinine running under 2% of cinchonidine than there is over that amount. The method used by the analysts was the recrystallization method, which is admittedly one of the best, show a maximum of 12.34% with 0.40%, 1.53% and 3.36% for the lower amounts of cinchonidine sulphate and with average of 6.24%. The water of crystallization varied from 8.6% to 16%. The U. S. P. it will be remembered allows 16.18% water of crystallization.

QUININE PILLS.

Samples of two-grain pills from five firms, obtained in original bottles were subjected to assay. All but one were found to contain from the full amount to four per cent. excess of quinine. The one excluded contained the full amount within two per cent., and is therefore not to be regarded as wilful withholding of quinine, as

the amount is altogether too small to be of any commercial significance. Reports have some time been made claiming deficient weight of quinine in pills, but as it is not a matter of ease to recover the full amount of quinine it is probably the case that the assays showing such low amounts were faulty. The process used for the above work was shown by several trials on known material to recover the quinine within 3-10th of one per cent. The present low price of quinine removes any temptation to sending out pills of short weight quinine, but even if it were not so, it would be the height of folly to do so with such a standard article.

CAFFEINE PILLS.

Samples obtained in original packages from three houses showed only one to contain the full amount of alkaloid. Why this should be so is difficult to understand.

OIL OF PEPPERMINT.

Twenty-three samples examined by appropriate methods showed:

6 adulterated with oil of camphor.

1 " " " " turpentine.

1 suspected adulterated with oil of turpentine.

2 adulterated with oil of pennyroyal.

2 suspected but adulterant unknown.

The frequent presence of weed oil contamination has been noticed, and this is often of a very disagreeable nature, and on a few occasions has been found to wholly unfit the oil for use.

REPORT FROM LABORATORY OF PARKE, DAVIS & CO.

ACETIC ETHER.

This we seldom find containing the amount of acetic ether required by the U. S. Pharmacopœia, i. e., about 90 per cent. Assays show it to vary from 25 to 75 per cent. The process of estimating being the official one modified slightly by substituting glycerine for the water, the latter being objectionable on account of the solubility of the ether in the water, especially in the presence of much alcohol.

STRONGER AMMONIA.

The stronger water of ammonia we find to contain in a majority of cases the required amount of ammonia gas, and to be free from impurities.

DILUTED HYDROCYANIC ACID.

This acid we seldom find to contain the 2 per cent. (by weight) of absolute hydrocyanic acid required by the U. S. P., but instead, ranging from 1.5 to 1.8 per cent, a maximum variation of 25 per cent. from the normal strength. The acid is, however, extremely prone to decomposition, and only a fresh article should be used.

CAFFEINE CITRATE.

In a majority of cases this salt possesses a faintly acid reaction and is in crystalline form, while in a few cases we have found it to have a distinct acid reaction, and decidedly sour to the taste, seeming to be nothing more than a mixture of caffeine and citric acid ground together.

CHLOROFORM.

While this article is sold at a low price, we are pleased to say that only a small percentage show even more than a trace of impurity, as indicated by the sulphuric acid test.

CINCHONIDINE SULPHATE.

Examined by the official process for the detection of foreign alkaloids, this salt is found to be pure, and containing somewhat less water of crystallization than allowed.

COCAINE MURIATE.

Of the many samples examined, representing various brands, we have, during the last year or two, met with only a pure article. One of the best tests being that of Geisel with a dilute solution of potassium permanganate for foreign organic matter, and often in the eye for irritating properties. We have reasons for believing that some impure salt is in the market, but it is not the larger white crystals, therefore it is advisable to use only this kind.

CALCIUM HYPOPHOSPHITES.

We have experienced no little trouble in procuring a pure salt, and have every reason for stating that the salt of commerce contains various amounts of sulphate, an objectionable impurity in the manufacture of syrup of hypophosphites and other compounds containing it. The salt should be soluble in water and free from sulphates.

ETHER.

We have examined any number of samples and have found none containing any impurities, and all of full strength.

GLYCERINE.

The only objectionable impurity found in this article is iron, and this only in traces, which would be objectionable when used in compounds containing tannic or salicylic acid.

IRON BY HYDROGEN.

We have experienced with this salt no little trouble in getting one of full strength, the highest result being 76 per cent. of pure iron and the lowest 29, with an average of about 50 per cent. We find that the U. S. P. test gives somewhat lower results than the German Pharmacopœia, and the one recommended in Hoffman & Powers' Chemical Analysis.

IRON AND QUININE CITRATE.

The amount of quinine anhydrous in this salt seldom reaches the full 12 per cent. required by the U. S. P., but ranges from 10 to 11.75 per cent., a majority of the latter strength.

MORPHINE SULPHATE.

This salt has seldom, if ever, been found to contain any impurities. The only objection being the dark or tinted color of some samples, though the amount of water of crystallization is 3 to 4 per cent. less, with an average of 14.5 per cent.—a limit allowed by us, instead of 16.+ as the official.

POTASSIUM IODIDE.

If this salt is purchased in the crystalline form, it is likely to be pure, but if in a powdered form, it should be looked upon with suspicion and tested for carbonate. This is also true with the bromide of potassium, and therefore both should be procured in the crystalline form, if not examined before dispensing.

POTASSIUM HYPOPHOSPHITES,

Is found in most cases to be fairly pure, containing small amounts of sulphates, chlorides and (exceptionally) carbonates.

SODIUM HYPOPHOSPHITES.

This salt almost always contains sulphate, and in some cases as high as 10 per cent.; other impurities in traces are calcium and carbonate.

CASCARA SAGRADA—RHAMNUS PURSHIANA, D. C.

Instead of this, both as an adulterant and substitute have been

employed the barks from *R. Californica*, Esch. (known popularly as "California Coffee") and *R. Frangula*, Lin. (known popularly as "European Buckthorn.")

BERBERIS AQUIFOLIUM, PURSH.

The root of other species of *Berberis* is very frequently substituted—all other species, at least of Oregon growth, where the collection is made, possessing less of the active principle Berberine. The principal substitute is *B. repens*, Lindl. The substitution may or may not be wilful.

EUCALYPTUS GLOBULUS, LABILL.

An isolated instance of where substitution is for the better. It is very generally understood among the trade that Eucalyptus oil is not now derived from the leaves of the above species, but from the *E. amygdalina* whose leaves yield about three times more oil than the original *E. globulus* leaves. Somewhat singular, also, is the fact that this oil so substituted is superior for every purpose both in the arts and in medicine. Oil of Eucalyptus odorata is also supplied and even considered superior to the oil of *E. amygdalina*.

STROPHANTHUS SEED.

An adulterant of very close resemblance to the glabrous varieties of this new remedy as offered upon the market is the seed of *Holarrhena antidysenterius*, Walb., an E. Indian plant. Of course this proves the adulteration to be anything but accidental, Strophanthus seeds growing in Africa.

HOANG-NAN.

The bark of the *Strychnos malaccensis* Bentham (Synonym. *S. Gaulthieriana*, Pierre] a comparatively new remedy in the treatment of paralysis, etc., is occasionally, if not frequently, entirely replaced by the bark of the False Angustura or Nux-vomica tree, the *S. Nux-vomica*, Linn. It is probably this substitution that has prevented the drug being received here with the same favor with which it is regarded in the countries of its habitat.

JABORANDI.

Some alleged substitution of this drug on its first introdution was shown to arise from the fact that this vernacular name was generic in S. America for almost any plant that possessed diaphoretic properties. Different districts holding one particular "jaborandi" plant in estimation in preference to the "jaborandi" plants of other

districts, even where these latter were also found native in the locality of the former. The source is now pretty well settled, however, but the leaves of *Serronia Jaborandi*, Guillemin, are still placed in small lots on the market as genuine Jaborandi (the *Pilocarpus pinnatifolius*, Lemaire.)

JAMAICA DOGWOOD. PISCIDIA ERYTHRINA, LIN.

Instead of the bark of the root which is the part possessing the the peculiar anodyne and hypnotic properties, for which the remedy has become so well known, cases have occurred where the bark of the tree has been known to have been openly offered upon the market. While the source is no doubt authentic, botanically it is still a substitution of a comparatively inert part for the one that is medicinally active, and is just as far from being a commendable substitution as if it were obtained from an entirely different plant, and equally injurious to the medicinal reputation of the remedy.

DAMIANA.

The leaves of the Mexican plant *Bigelovia venata*, Gray, have been known to be mixed with the leaves of the true plant *Turnera diffusa*, Willd., *var. aphrodisiaca*, Urb., (Synonym, *Turnera mycrophylla*, D. C.) Both leaves are very small, not exceeding ½ an inch, and they are otherwise very similar. The two plants belong to different natural orders, but the adulteration is only detected on a very close examination.

GRINDELIA SQUARROSA, DUNAL.

We have been approached at various times with samples purporting to represent the above, but which were *G. robusta*, Nuttall. We have been assured at the same time by the parties offering that they supplied orders in New York, etc., for the article—proving thereby that a substitution was being employed by the purchasers unwittingly(?).

YERBA REUMA.

This plant, the *Frankenia grandifolia*, Cham. et Schlecht., was, on its first introduction by us, substituted by a Cincinnati house by the *Distichlis maritima*, Raf., a totally different plant. Its only claim to similarity was in the locality of its growth. We have not heard recently as to whether the substitution is still practiced.

DANDELION ROOT, (GERMAN,)

is very scarce and difficult to obtain, in consequence the American (an inert root) is freely offered.

GOLDEN SEAL,

of usually good quality—yet an adulterant consisting of "Levin leaf" root is occasionally found.

CANTHARIDES,

found to be frequently adulterated with a variety possessing no therapeutic merit.

MR. BROWN: The report of this committee is a very valuable one. It certainly represents a good deal of work, and I move that a vote of thanks be extended to the committee.

Which motion prevailed.

MR. EBERBACH: I would like to ask Mr. Johnson if, in his investigation of peroxide of lead, he came across any impurities in the shape of manganese salt?

MR. JOHNSON: Yes; I did not mention it, however. Traces of manganese were frequently found in the peroxide of lead, but the most universal impurity was the chloride with traces of iron.

PRESIDENT: We will now take up the report of the Committee on the President's Address.

MR. VERNOR: The attention of the School of Pharmacy, the Medical Department of the Michigan Univesity, the Detroit Medical College, and the Michigan Medical Association, if incorporated, should be called to the fact that they are entitled to be represented by delegates to that convention.

On motion of Mr. Stevens the recommendation was adopted.

MR. VERNOR: That the following resolution be declared the sense of this meeting:

Resolved, That we endorse the metric system and recommend its use wherever practicable.

MR. STEVENS: I am strongly in favor of this resolution, I do not understand that we are to adopt it to the exclusion of all other weights and measures. The resolu-

tion is a good one, and we should adopt it and not be behind the times. Other branches of science have adopted it long ago. Even the National Convention of Photographers has adopted it, and it went into effect this season.

There is a great deal of objection to our Pharmacopœia by druggists, as it stands. That, I think, is largely due to the attempt to compel them to weigh all liquids, except the finished fluid extracts. We have seen the disadvantage of manufacturing preparations in this way. Many liquids could be more conveniently weighed than measured, such as oils and syrups. At the same time, it is difficult to percolate to a given weight. It requires, not only constant watching, but constant weighing, which would not be required if percolated to a given volume. I should be in favor of retaining parts by weight as in the present Pharmacopœia in all cases, except in the manufacture of those galenical preparations which are made by percolation.

MR. BASSETT: I do not want to oppose the metric system where it comes in use, but I don't think it is practicable in daily use in the store.

MR. STEVENS: I don't know why we, as pharmacists should be compelled to manufacture by other weights, simply because physicians prescribe by them. It makes no difference whether they prescribe by metric or troy or some other system. The system in use by Great Britain is far superior to ours. They use the advoirdupoise weight in dispensing. Their fluid ounce has the same number of grains as the advoirdupois ounce. In ours there no similarity. We have the fluid ounce of 455.7 grains, the troy ounce of 480 grains, and the advoirdupoise ounce of 437.5 grains. The Imperial is better than ours, but the decimal system is still better and similar to our standard of coins. The pharmacopœias of most nations are using the metric system. I do not wish to exclude all other weights and measures. I think that we should retain them for another decade.

MR. CALDWELL: What is the use in the Medical College at Ann Arbor?

MR. STEVENS: It is the regular so-called American system, but it is just as I said before, why should we be compelled to manufacture by it. As long as the Pharmacopœia recognizes a certain strength there is no need of manufacturing by the same system that the physician prescribes by. The Pharmacopœia directs parts by weight. It does not say what weights or measures you shall use, you may use any system.

MR. PERRY: The government adopted the metric system long ago.

MR. EBERBACH: We have applied the decimal system in all our laboratory work and we find it to be the most convenient way of weighing chemicals or preparations. It strikes me the great difficulty is that when we talk of the metric system the first impression is that it must be in grammes. Nobody says it must be in grammes. It is only necessary to have a unit and take decimal parts of it. You can use advoirdupoise or troy weights. The great stubbling block to the introduction of the metric system is not with the pharmacist, but with the physician. It is he who does not wish to introduce it and who will not take the trouble to learn it. The result is that the pharmacist is obliged to continue to use the old English system—which, by the way, I do not recognize as the American system. It came from the other side of the Atlantic. We ought to force the medical profession into it as far as we can. It is a system that ought to be adopted. Engineers are getting to use the system in their measurements. But they do not have to consult the notions of a second party, while we do.

PROF. PRESCOTT: I believe the greater part of the dispute about the metric system in the Pharmacopœia is a dispute about differences that do not exist, except in imagination. It is the recommendation of the committee

which we are discussing, and my name is appended to the report of that committee, but while I support the resolution, I should be glad to support the following amendment thereto: "That we advise the introduction, into the Pharmacopœia, of absolute quantities by troy weight and wine measure, in addition to the decimal parts by weight."

The Pharmacopoeia has been blamed for many things not done. Strictly speaking the metric system, the use of grammes and decimals of a gramme for weight, and of cubic centimeters and multiples of it for measure, has not been generally adopted by the Pharmacopœia except for analytical work, and this use for chemical analysis has never been objected to. In the first place, the great mistake was made, as I believe, by the last two Revising Conventions, those of 1870 and 1880, in undertaking to abolish measures by volume, and to weigh all liquids. That has nothing to do with the metric system whatever. The metric system goes just as much by volume as weight. Analytical chemists use volume measures in certain of their most exact work. Who is responsible for the mistake? I hope no one has the idea that the last Revising Committee was responsible for it. The Convention of 1870 ordered that measures by volume should be abandoned and the Revising Committee disobeyed the order, because they couldn't get through the work of obeying it. The Convention of 1880, having a preponderance of medical delegates, repeated the same order. The Revising Committee of twenty-five only obeyed their instructions. The great majority of the medical profession of the country seem to have blamed the Pharmacopœia for the adoption of weights for liquids, but their own representatives ordered it done The only delegate from Michigan who was present in the convention, Mr. H. B. Parsons, from the School of Pharmacy, consistently opposed that change throughout the meeting of the Convention, and was always of the opinion that volume measures should have been retained. This question is especially important with reference to

tinctures. They are now made up to weight. Of course, they are not prescribed by weight. They never will be prescribed with directions for administering them to the patient by weight. A dose of any liquid is given to the patient by volume. Exactness requires the administration of a fixed quantity by weight of absolute medicine in a fixed volume of liquid. Our present fluid extracts provide for this. A given weight of a drug, is exhausted and made up in the finished preparation to such a volume as, filled with water, would weigh as much as the drug weighs. I think it was another mistake, in the last Revising of the Pharmacopœia, to reject American weights and measures, grains and ounces. I do not say it was a mistake to admit decimal weight and measures, I do not think it was. I think the two systems should be placed side by side in the Pharmacopœia. A large number of pharmaceutical workers prefer a decimal system. They would prefer to take five, ten, or twenty parts and make up to one hundred; to go by parts in weight, or parts in volume. A decimal system is convenient in adapting operations to large or small quantities. Its inconvenience, if it has any, lies in the lack of decimal weights themselves, and the annoyance of making up decimal multiples with troy denominations. In the mean time parallel statements with troy weight and wine measure give a decided advantage for most pharmacists. Therefore the Dispensatories had an advantage over the Pharmacopœia.

A great deal has been said about knowing the decimal system, about studying it and becoming familiar with it. Well, what is it to know the metric system? It is mainly to know the value of decimal denominations *in the terms of the old system.* For instruction of the pharmaceutical public let both systems be placed parallel in the Pharmacopœia. I don't think it is any of our business whether physicians prescribe by the decimal system or not. As I grow older I put less stress upon forms of expression; as whether we shall have the Centigrade or the Fahrenheit

scale in use. No system of expression is absolutely perfect. The disadvantages of a change are very great. The main thing is security against blunders. Whatever denominations physicians may use, and aside from the metric system or troy system, it is a chemical privelege to introduce decimal parts by weight and by volume, for pharmaceutical uses.

MR. VERNOR: It that amendment in the nature of a communication to the Committee on Revision of the Pharmacopœia? If it is, let it be so stated.

PROF. PRESCOTT: I have supposed that an expression of this Association, on weights and measures, would go to the Committee on Revision of the Pharmacopœia.

MR. VERNOR: Only as a copy of the proceedings go.

PROF. PRESCOTT: I think we had better present it officially. The present Revising Committee has issued to all State Associations and other bodies of pharmacy and medicine a request to make recommendations regarding weights and measures, as well as respecting any other points they desire to be heard upon.

MR. BASSETT: I most heartily support Prof. Prescott's amendment. I seem to have borne the brunt of whatever opposition there has been to this measure heretofore, and I think Prof. Prescott has let me down very easily. He takes exactly the ground I have heretofore taken, although I have not been able to express myself in such plain terms as the Professor. He has admitted, tacitly, if not fully, that there was a mistake in the last revision of the Pharmacopœia. Mr. Stevens has not been willing to admit that heretofore, but I hope he will now.

MR. STEVENS: The reason why very many physicians do not prescribe by the metric system is because pharmacists do not have the metric weights, and they convert their prescriptions from one system to another, and the physician is afraid they will make some mistake.

PRESIDENT: We will now proceed to the consideration of the other recommendations of the Committee on President's Address.

MR. VERNOR:

Resolved, That in the sale of proprietary articles this Association recognizes a growing evil that menaces the health of the community at large, and recommend that their sale and use be discouraged upon every possible occasion.

I move the adoption of the resolution.

The resolution was adopted.

MR. VERNOR: The next recommendation was that a committee of twenty be appointed on membership, whose duty it shall be to devise and carry out a plan to increase the membership and interest in the work of this Associasion. I would say in connection that I would like to add to that that the committee be appointed by the president elect, with the advice of the secretary, and that the appointments be made later on.

MR. BROWN: I favor the adoption of that resolution. I desire to impress upon the members the importance of securing a larger membership. We have dropped from our list the last two years about 200 members. While we admitted a large number last year, it resulted in a net gain of about 30. If we are to have sufficient funds to keep this Association in condition to do efficient work, we must increase our numbers largely. We have about 3000 registered pharmacists and assistants in the State, and only about one-third of them in the Association. That condition of things ought to be reversed.

Mr. Vernor last year won a gold medal for obtaining a large number of new members and the medal was offered this year to any one who would see fit to compete for it. But there has been no competition worth mentioning and Mr. Vernor is entitled to retain it until we have some active competition for it. The committee that will

be appointed ought to take some active measures to secure new members.

Mr. Bassett suggests another course, requiring every registered pharmacist and assistant in the State to be a member of this Association; in other words, to incorporate the Association into the Board of Pharmacy or the Board of Pharmacy into the Association.

MR. VERNOR: I think that the committee ought to consider the question of whether it is advisable or necessary to change the pharmacy law.

I would say with reference to the medal that perhaps there might have been a misconception among the members as the Association in regard to it. The medal is at the disposal of this committee of 20 and they can make its ownership absolute after the next meeting, or it may be made competitive for all time to come, if they do not like that. I think there will be no trouble in getting up a badge to be given to the person securing the largest number. It is possible that members may look upon it that this badge is one that they would have to give up if it was won by somebody else. I only value the badge for the good it may do the Association.

MR. BASSETT: It seems to me it would be well to discuss this question of the membership of the Association at the present time, and if it is thought desirable to make any changes in the method of securing members, or to keep those that we have, it should be laid before this committee as the will of the Association.

I believe that the Illinois Association have struck about the right plan. In order to make these State Associations useful and permanent we have got to have the pharmacists of the State interested. The question is, how are we going to interest them, and after we get them interested once, how are we going to keep them interested?

The three dollars for joining and a dollar a year dues may seem like a small matter, but our ledger tells a very

different story. There are a great many men who do not want to pay this dollar, at least they *don't* pay it. A good many dont *wish* to pay the registration fee, and would get out of it if they could. I believe the time to commence to settle this matter is right now, and I go back to the same idea that I advanced last year, that the registration fee ought to pay the expenses of this Association, and the registration of a pharmacist entitle him to membership. The Illinois Association is working on these lines with apparent success, and I would like to hear this matter discussed.

MR. VERNOR: The money we have deposited in the State treasury is subject to the order of the State Board of Pharmacy, and if the law were so changed as to allow the payment of the running expenses of this Association, that money would come out if needed.

MR. ALSDORF: I don't think you could pass such a law. I don't believe the legislature of Michigan could be induced by any means to turn those funds over to us.

MR. VERNOR: They are not the funds of the State of Michigan, they are funds held in trust, and if it becomes a necessary expense of the Board to pay the expenses of this Association the money will come out for that purpose.

MR. ALSDORF: I don't think you can secure that kind of legislation.

PROF. PRESCOTT: I think Mr. Alsdorf's opinion is entitled to a great deal of weight in this matter. However just it may be to pay the expenses of this Association as the expenses of the Board of Pharmacy are paid I think we had better go slowly in urging it. The example of Illinois is not very encouraging, in view of the change in their pharmacy law. When public confidence in the present law has become fully grounded, the measure now suggested may be practicable.

MR. VERNOR: I agree entirely with the Professor. It

has been the idea of everybody who has had any interest in the pharmacy law that we had better go cautiously in attempting to make any change in it, for fear we might fall into a dilema similar to the one which was encountered in Illinois.

MR. BASSETT: I agree with the sentiment that we should make haste slowly, in fact we *are* making haste slowly. We commenced talking about it last year, and my suggestiom now is to think about it another year, and then we will try to do something. In my efforts to bring about a change, I am simply working at the idea of requiring just as little money as possible from the pharmacists of the state.

MR. EBERBACH. I am in perfect accord with the ideas that have been expressed. I think we have got something before the Committee of a very formidable character. As long as the Association represents only about one quarter of the pharmacists of the State, the members of the Association are the only ones that are directly benefited by the saving of the annual dues to the Association. The three-fourths who are outside have nothing to gain, but if we can build up this Association so it will represent two-thirds of the pharmacists we are in a different position.

MR. H. G. COLEMAN: I think that a good deal of this discussion is practically on the wrong point. Mr. Bassett seems to think that the great difficulty in holding our membership is the matter of a dollar a year. Now, I think Mr. Bassett is mistaken. He seems to think if we were to do away with the dues that the druggists of the State would have more interest in the Association. Now, it is of no benefit to the Association to increase its membership by adding those who care nothing about it. It is possible that the initation fee of three dollars is something of an obstruction to the rapid increase of membership. But I do not believe that any man who is worth having in the Association is going to hesitate or drop off on account

of a dollar a year, and, if we release him from that obligation I do not think it will increase his interest in the Association. Now the question is, if I am correct in my presumption that the membership is decreasing, what has caused it? How can we remedy this evil? I remember that four or five years ago, soon after the Association was organized, and while we are all interested in securing our legislation, that there was a good deal of interest all through the State, because we had something before us that we wished to accomplish, something which we thought was going to benefit the drug trade, not only in an ethical and professional way, but in the matter of dollars and cents. We accomplished that work well, I believe, and satisfactorily to the druggists of the State. I am not aware that much of importance has been done since that has tended to help us. I think there is a feeling throughout the State that the Association at present is not accomplishing anything. If we want to get the druggists of the State fully interested in this Association we must show them that we are working for the benefit of the druggists, financially. We must bear in mind that the number of druggists of the State, who are interested in questions of pharmacy and chemistry is comparatively small. The great majority of them are engaged in the sale of all sorts of things; more interested in that than they are in resinoids, ethers and such things, and while I am not in favor of leaving out the professional part, or in favor of lowering the profession into a mere trade, we still must recognize that element if we want to interest them. I have nothing to suggest as to what we should do. I would not be understood as at all criticising the work of any of our previous Executive Committees, for I have no criticism to make on their work, but I thought I would suggest that it is not the matter of a dollar a year that is to be overcome. It is a matter of getting people interested, and if you once interest them the dollar a year will come all right.

There are a great many questions which interest us

financially. The evil which exists in some towns of physicians dispensing all their own prescriptions, buying their medicine in Detroit and Chicago, is an evil which some of us groan under. I don't know whether this Association could help us any in that respect, but if it were known that the question was to be discussed here possibly some benefit might come from it, and I believe that there are quite a number of men in Kalamazoo, and other parts of the State who would be here. I would not suggest that our actions here are more ethical than practical, but I think the resolution passed a little while ago in which we made an unfavorable criticism of patent medicine, is a question which interests us all; but we all know that the druggists of the State won't subscribe to it. I presume that every man engaged in the business throughout the State when he sees that resolution will say, "that is theoretical; let them come on here to the little towns with that theory and they will starve to death, that is all." I doubt the wisdom of subscribing to anything of the sort.

I have made a wandering talk, but the point I wished to make was that we want to make our meetings of interest in order to get members and hold them.

MR. BASSETT: The point is right here, Mr. Coleman suggests certain things that won't do. Now, we can't do things without money, that is as sure as the world. Let me put the climax to your talk. We had here yesterday a Committee from the Wholesale Druggists' Association asking us to send a delegate to Indianapolis next month, to meet with them to devise ways and means for the advancement of our business. This convention has appointed a delegate to go there, and if he goes he must pay his own expenses. That is where dollars and cents come in. If the money for registration could be made available for the legitimate uses of this Association we could take care of these things. As it is, we hardly get money to pay the running expenses of the Association.

PROF. PRESCOTT: I would like to suggest to this Committee that they report upon the question, whether or not the initiation fee might be reduced with financial advantage to the Association.

MR. PERRY: I have always been of the opinion that the initiation fee was too high, and my experience in trying to get new members has confirmed it.

SECRETARY: I was told yesterday by one of the prominent members of this Association, that he was convinced that a good many had allowed their names to be dropped from the roll because of the position the Association has taken in regard to the sale of patent medicines. We can talk about it as much as we please, but patents constitute a very large percentage of our business. The public have got to become educated to this patent medicine evil before the druggist can do much. It is a question in my mind whether we ought not to reconsider the resolution which was adopted a short time ago. We have handled this subject pretty thoroughly in the past, and as Mr. Coleman has suggested, that resolution will have rather a dampening effect on those who might become members of this Association.

In regard to the annual dues, a great many are not paid through simple neglect. This year one or two members of the Association (I have Mr. Lyman of Manistee in mind as one) collected all the dues from members in his town and brought them with him, and if every member of the Association would do that we could gather in a great many more dollars every year than we do. I hope the members will bear this in mind.

MR. BROWN: I move the adoption of the report calling for the appointment of a committee of 20.

The motion was carried.

MR. VERNOR: The next part of the report "The President's suggestion in relation to the defraying of the expenses of delegates from the Association to the conven-

tions in Washington and elsewhere, do not meet the approval of your committee, who cannot but feel that the honor of such an appointment should be sufficient to offset any expense that might be incurred."

MR. PARKER: I believe some of these committees are of great importance, and especially so are the delegates to the Wholesale Druggists' Association, and to the American Association. I think we ought to send men and pay their expenses.

MR. BASSETT: This Association to do effective work must send good men to these meetings and that is particularly so with regard to the meeting which is to revise the Pharmacopœia; and it is not infrequently the case that the men who are the best qualified cannot spare either the time or money.

PROF. PRESCOTT: I would inquire of the secretary how much money could be saved by reducing by 100 pages the size of the volume of the proceedings the coming year.

SECRETARY: I can only give you an approximate idea. The proceedings were published last year at an expense of $275, which was about $150 less than it has cost before. I think possibly we could get out a thousand copies of 125 pages for $175.

MR. EBERBACH: I endorse the remarks of Mr. Bassett. The Association must select men who are good parliamentarians.

MR. BROWN: I move as an amendment to the report of the committee that the Association appropriate $50 each to three delegates, to the Convention for the Revision of the Pharmacopœia.

The amendment prevailed.

MR. EBERBACH: I move to reconsider that portion of the report regarding the patent medicine clause.

The motion prevailed.

MR. EBERBACH: I move to strike out the entire clause

referring to patent medicines, and let the question alone for the present.

PROF. PRESCOTT: I support it. I believe the sale of patent medicines by pharmacists is justifiable while law remains as at present.

The motion was carried. The report as amended was then adopted.

MR. PRALL: I have learned since entering the room that the Association had invited itself to Saginaw. I was hastening here to invite you to come, and as you have chosen to meet there we will do our best to entertain you.

On motion the Association took a recess until 2:30 P. M.

AFTERNOON SESSION.

At 2 o'clock the Association was called to order, Mr. Eberbach in the chair. After the reading of several papers, Mr. A. B. Stevens gave a very interesting and instructive description of a visit made by him to the mercury mines of California. The process of separating the mercury from the ore he described as follows:

The fire is made to pass through the ore, decomposing the sulphide and volatilizes the mercury. The mercury vapor and products of combustion are then carried into the condensing chambers, which consist of a series of pipes and towers, and the mercury is condensed and drops to the bottom, and the gases pass off. The products of combustion are carried through a large chimney made of sewer pipes, laid up the side of a mountain, and thus the vapors are carried to an elevation where they do not interfere with the people living about the works. The mercury then runs through troughs into a receiver filled with water, from which it is placed in the ordinary iron bottle. There is considerable mercury in the cinders and these have to be rubbed out and cleaned by putting them into a receptacle something the shape of the letter V, where they wor the cinders off and the mercury runs down to the bottom, thence into the receiver again. I have a little piece of the ore here which I wi\\ pass around, as some of you may like to examine it. This

the natural ore as they obtain it, some of it being very fine and some of it very coarse. The second sample is a piece after passing through the furnace.

PROF. PRESCOTT: Here is a question from the question box, "Would it not be better to make our fluid extracts of other strengths and thus avoid all evaporations, separations, etc.?"

I suppose that refers to the question of half strength, or to some other grade of strength.

A MEMBER: I believe, in point of economy, it would be better if fluid extracts were made 25% weaker than they are now. The great objection seems to be in exhausting the drug so a pint will represent a pound.

PROF. PRESCOTT: My own judgement is that strict uniformity is worth more than anything else, and I think we should avoid changes of strengths.

MR. STEVENS: I can not see where there would be any great economy in it. I think this is a point on which we are more dependent upon the physician than in the matter of weights and measures.

MR. BASSETT: Don't you think that experience shows that tinctures are falling into disuse?

MR. STEVENS: Yes, sir, no doubt of it.

MR. PARKER: I would like to ask what has been the experience of those here with abstracts.

PROF. PRESCOTT: If abstracts had been named, graduated solid extracts, and presented as such, I think there would have been no unfavorable criticism upon them. An abstract is simply a graduated dry extract under another name, and for one argument that can be advanced for 50% fluid extracts, several can be advanced for graduated dry abstracts. But it is entirely useless and wholly inadvisable for the Pharmacopœia to propose any such preparation in advance of the medical demand.

MR. STEVENS: There is a great amount of labor spent

on abstracts and what have you for your labor? A preparation only twice as strong as you started with. If they were four or five times stronger than the drug there would have been some reason for their use.

PROF. PRESCOTT: Here is another question. "Is it not advisable that this Association recommend three names to the Governor from which to select a member of the State Board of Pharmacy?" This is followed by a resolution, which I suppose to be offered here for discussion. "Resolved: That no member of the Pharmacy Board shall succeed himself."

MR. WURZBURG: I recommended two years ago that we send the names of three members of this Association to the Governor from which to select a member of the Board of Pharmacy. I do not approve of the resolution suggesting that no member should succeed himself. I think it would be a good idea to decide at this meeting to send to the Governor the names of three of our members, with Mr. Eberbach's name at the head, as our choice.

MR. STEVENS: I agree with you exactly.

PROF. PRESCOTT: I think the suggestion of sending names to the Governor is purely a question of expediency, a question of what we can do and be understood. We know the legistature, at the time our law was adopted, refused to allow us the legal right of nominating the members of this Board; but I suppose anybody has the right to petition the Governor. Regarding the resolution: An officer of the State is a servant of the State, selected for his service. What would we think of a proposition that no one in our domestic establishment should be retained for a period longer than a year, or a term of three years? What if in your business you could only retain an assistant for one year, or three or five years? Office is not for the benefit or honor of the individual, but for the good of the public and the State, and as a body of pharmacists we

cannot afford to make a change merely for the sake of distributing the offices.

MR. VERNOR: This question was brought up at Petoskey and I spoke upon it there. I can only reiterate what I said then when I was the retiring member of the Board, and that is that it is perfectly proper for this Association to suggest names to the Governor, not in the spirit that the Governor shall use these names, but simply as a suggestion coming from a body that takes a great interest in pharmacy.

MR. WURZBURG: I believe the Governor would be glad to receive a recommendation from this Association for a member of the Board of Pharmacy, and I believe he would act in accordance with our wishes. We are better qualified to know who are the best men to fill such positions than the Governor is.

MR. EBERBACH: I am probably more interested in this discussion than anyone else, being the one whose term expires January next, and I take the same stand now in regard to this matter that I have taken over and over again. The position was never sought by me. If the Association, or the State of Michigan desire my services in that connection, they must come to me and propose it. That would be my position at any time. Furthermore, we have a large number of pharmacists in this State who are perfectly competent to take charge of the affairs of the Board and carry them on successfully. It is not necessary that the Board should circulate among a few members of the profession, and I am perfectly in accord with the spirit that names should be presented to the Governor from which he may select. I think the Association has the right to present names, the same right that an individual would have, if they present them in the spirit of a suggestion. The position I assure you is no easy one, nor is it a sinecure for men engaged in our business, and it is not an

office that would attract the attention of anyone, except for the purpose of assisting in executing the law.

MR. DUPONT: I can see no objection to presenting names to the Governor, and I would suggest that every member of the Association should urge the appointment of a proper person.

MR. COLEMAN: It seems to me it would be eminently proper for this Association to make a recommendation to the Governor.

MR. BROWN: In order to test the question, I move that the Association present three names to the Governor, from which to select a member of the Board of Pharmacy, as a successor to Mr. Eberbach. I know there are many in the Association who think this a privilege that the members should enjoy.

The motion prevailed.

MR. VERNOR: I would suggest that you put the form of request which yon propose to make to the Governor in writing, so we may see it.

MR. BROWN: I present the following:

To the Hon. Cyrus G. Luce, Governor, Lansing, Mich.:

DEAR SIR—The Michigan State Pharmaceutical Association begs leave to respectfully submit to you the names of three gentlemen for your consideration, in connection with the appointment of a member of the Michigan Board of Pharmacy, to fill the vacancy which occurs December 31, 1889, by the expiration of the term of office of Mr. Ottmar Eberbach, of Ann Arbor. This Association feeling a great interest in the work of the Board of Pharmacy, suggests these names in a spirit that we trust will not be misconstrued into any design to interfere in the slightest manner with a prerogative which we thoroughly understand is entirely your own.

PRESIDENT: It is now in order for the Association to make nominations.

MR. WURZBURG: I nominate as our first choice Mr. Ottmar Eberbach.

Mr. Eberbach being in the chair, the motion was put by Mr. Stevens and was unanimously adopted.

MR. PARKER: I nominate Mr. Hugo Thum.

MR. STEVENS: I nominate Mr. George Gundrum of Ionia, as the third member.

MR. WURZBURG: It suppose it is understood that in sending in these names they shall be sent in such a way that it will be understood that Mr. Eberbach is the first choice of the Association.

MR. STEVENS: It was voted for in that way.

MR. BROWN: Whose duty shall it be?

MR. STEVENS: The Secretary's of course.

MR. EBERBACH: I am obliged to the members for their courtesy. There has been more or less published in some of the papers of the State regarding renominations of members of the Board to succeed themselves. I hope none of the pharmacists of the State will attribute any such design in the nominations that have been made the last few years. If it is the pleasure of the Governor to tender me the renomination, I will accept it, as I do not deny I like the work, but I wish to have it understood that there has been no scheming for the place on my part.

The president elect, Mr. Frank Inglis, was then introduced to the Association by Mr. Eberbach.

MR. INGLIS: Four or five years ago I was chosen second vice-president of this Association. At that time I hoped for promotion. At the next meeting I was made *third* vice-president and my hopes went down. I thought I would never get above second vice-president again. What has bothered me most since I was elected president is the thought that in all probability I would be called upon at East Saginaw to respond to the toast "The Michigan Pharmaceutical Association," but I find now that it is not necessary, and therefore I accept the position and am very much obliged to you.

MR. COLEMAN: Before we adjourn I wish to offer a resolution:

Resolved, That we, as an Association, hereby express our appreciation of and our gratitude for the very liberal hospitality and social entertainment which has been extended to us by the wholesale and retail druggists of Detroit, and also to Mr. H. C. Parke for the entertainment he afforded the members at his residence in this city. We especially thank Mr. Arthur Bassett, the local secretary, for the complete manner in which he has anticipated our needs, and the painstaking attention he has given to every detail, thereby insuring to us an unusually enjoyable and profitable meeting.

The resolution was unanimously adopted.

MR. DUPONT: We do not want to forget that there is a gentleman connected with this Association who has not only done a great deal of work for us, but has neglected his own business to a great extent to secure the success of this meeting. I refer to Mr. Bassett. I move that the usual amount ($50.00) allowed for the services of the local secretary be paid to him.

Carried.

On motion the Association adjourned to meet in Saginaw on the third Tuesday in September, 1890.

In Memoriam.

N. P. BLAKESLEE, Elmira.

THOS. L. BLAKLEY, Jones.

J. A. CROOKSTON, Grand Rapids.

ELBRIDGE D. GIBSON, Detroit.

SAMUEL S. GARRIGUES, Ph. D.,
Ann Arbor.

J. L. HALL, Chatham, Ont.

J. H. LONSBURY, Reed City.

DR. J. C. MUEHLER, Detroit.

W. E. SHORT, Manistee.

A. S. WALLACE, Prescott, Ont.

ANSWERS TO QUERIES,

AND

VOLUNTEER PAPERS,

READ AT THE SEVENTH ANNUAL MEETING IN DETROIT.

Nux Vomica.

ASSAY OF ITS PHARMACEUTICAL PREPARATIONS. ESTIMATION OF STRYCHNINE AND BRUCINE IN MIXTURE.

A VOLUNTEER PAPER.

BY H. W. SNOW, PH. C.

Since the publication of the exhaustive investigations into the botany, pharmacy and chemistry of Nux Vomica by Messrs. Dunstan and Short, pharmacists have displayed a considerable activity in pursuing the investigations which were thus begun, so that at the present time there is a very considerable amount of information to be found concerning the assay of this drug and its preparations.

The estimations of total alkaloid in the tincture, fluid extract and solid extract, the three prominent pharmaceutical preparations of the drug, is a matter of ease and accuracy and no pharmacist need be deterred from undertaking their assay through mistaken ideas on this point, though it is true that an analytical balance is essential. A sufficient number of assays of the tincture and of the solid extract have been published from time to time to have pretty well settled the maximum, minimum and

average percentages of alkaloid which they contain and thus to enable if it is so desired, the next pharmacopœial committee to adopt alkaloidal standards for them. Assays of fluid extracts have, however, been less numerous and the writer has collected such as have come within his notice and added thereto some from his own experiences which may thus be found serviceable.

The fluid extract may be assayed (and the tincture similarly by evaporating 25 c. c. to 10 c. c.) by diluting 5 c. c. to 50 c. c. with water, adding water of ammonia and washing out the alkaloid with three or four successive portions of chloroform. From the mixed chloroform solutions, evaporated if need be to a convenient bulk, remove the alkaloid by washing with dilute sulphuric acid of two or three successive portions. From this solution again take up the alkaloid (after rendering alkaline with ammonia) with chloroform; evaporate to dryness. Again dissolve in chloroform and transfer carefully with washing, *and without filtering* to a weighed beaker, evaporate dry at 100 deg. c. and weigh the mixed alkaloid. The second solution in chloroform is made for the purpose of leaving behind the small amounts of ammonium sulphate which is almost invariably transferred with the chloroform in drawing it off. Drying must be thorough as it not infrequently happens that small amounts of chloroform are mechanically retained in the alkaloid and is not easily driven off by slight heat. The solid extract, (about one gramme) may be dissolved in water with the aid of a little ammonia and warming, diluted to 50 c. c. and treated same as the fluid. Further details of assay will not here be given but following this paper is a short bibliography on the assay of the drug and its preparations as contributed from 1881 to date. A. B. Lyons has given us a record of six assays of fluid extracts showing a range of 0.60 to 1.6 per cent. with an average of 1.05 per cent. total alkaloid. And the committee on adulteration of the New York State Pharmaceutical Association* gave assays of six samples

* Drug. Circ. 1886–173.

showing unusual uniformity in strength, varying from 1.8 per cent. to 1.2 per cent. with an average of 1.5 per cent.

The following is a record of light assays taken from my own notes: 0.58 per cent., 0.92 per cent., 1.35 per cent., 1.47 per cent., 1.98 per cent., 2 per cent., 2.04 per cent., 2.54 per cent.; average 1.61 per cent. W. Simonson has given us the result of assays of thirty-four powdered extracts showing as low as 2.24 per cent. and as high as 18.9 per cent. with an average of 12.8 per cent. though the general average excluding the unusual extremes would show a somewhat higher percentage. A limited number of assays made by the writer, of powdered extracts of the drug give a slightly higher average than this and shows the powdered extract to be not greatly inferior to the pilular extract which has been shown to average about 15 per cent. of alkaloid.

SEPARATION OF STRYCHNINE AND BRUCINE.

Though the estimation of the total alkaloids of Nux Vomica is a simple task, it is not so in the case of the separation of strychnine from brucine.

Dragendorff after trying published methods concluded there was no known process for their separation on an analytical scale with satisfaction and therefore recommended an indirect method depending on the different titration equivalents of the two alkaloids with Mayer's reagent. This reagent for an equal volume, precipitates more brucine than strychnine, consequently *less* of the reagent would be required to precipitate the alkaloid if it were all brucine than would be required to if it were all strychnine. Thus in titrating a known weight of the alkaloid, if less reagent is required to precipitate it than would be the case with an equivalent weight of strychnine, and more is required than would be the case if it were all brucine, a mixture of the two would be inferred and their relative qualities would be in proportion to the amount of reagent required and the titration equivalents of the two

alkaloids. This process has been called into question and the writer can bear further testimony to its worthlessness. In the first place, the equivalents accepted were those of Mayer himself and that for brucine has since been shown to be far from correct. Three or four titrations were, however, performed with a view of adopting the later and corrected equivalents of brucine in the calculation but the results were negative and further experiment was abandoned as useless. Brucine is too fickle in its behavior with this reagent to make it at all a reliable means of assay. Dr. Lyons has proposed* to estimate the proportion of strychnine in the mixture of the alkaloids by determining the weight of the precipitate with Mayer's reagent from a known weight of the alkaloids. Whether this is an improvement on the volumetric method has not yet been fully determined. Dunstan & Short's recommendations for separating the alkaloids by precipitation of strychnine with ferrocyanide of potassium under carefully prescribed conditions of acidity and dilution was early called into question by Scweissinger† who found that he always obtained more strychnine and less brucine than he commenced with. In a series of some eight or ten experiments performed a little over two years ago, the writer was unable to substantiate the experiments of the authors of this process. It was found that washing "until free from bitterness" was not a reliable criterion to judge by as in the first experiments washing though discontinued before freedom from bitterness was obtained was excessive. The strychnine obtained was *less* in amount than was started with but still was contaminated with brucine. Later experiments with more moderate washing yielded results too high in strychnine and too low in brucine and the strychnine was always contaminated with brucine as

* Drug. Circ. 1886–137.

† Ph. Jour. and Trans. [3] XVI–447; Amer. Drug. 1885-230' both from the Archiv. de Pharm. [3] XII–579 and 609.

shown by the nitric acid test. It thus appears that the solubilities of the ferrocyanides of these two alkaloids, under the conditions prescribed, are too close together to make it a close means of separation. Holst & Beckurts* have published a volumetric modification of this assay which they claim to be preferable to the original. The authors maintain that in adding the ferrocyanide to solutions of the mixed alkaloids, the strychnine is precipitated first and the brucine only comes down when an excess of precipitant has been added. The assay is carried out by adding to a solution containing from ½ per cent. to 1 per cent. of the mixed alkaloids, hydrochloric acid to distinctly acid reaction. Then run in, in small amounts at a time, a solution of ferrocyanide of potash of know strength until a filtered drop of the fluid produces a stain on paper impregnated with ferric chloride. From these data calculate the strychnine. This process seems well worthy of attention but the writer has not yet had opportunity to verify it and has seen no further reports on it. Schweissinger† has recommended an indirect method for the estimation of the alkaloids by titrating a known weight of them with standard acid and alkali using litmus as an indicator. This process seems to be well thought of and in use by some chemists but it is difficult to get an indicator which is sufficiently sensitive—cochineal, litmus and methyl orange having been tried with little success. Separation with absolute alcohol was tried but abandoned by Dragendorff‡ as an analytical process, and it was also the experience of Dr. A. B. Prescott‖ with alcohol of sp. gr. 0.941 (39.3 per cent. abs. alcohol by weight) that the separation was not sufficiently close for analytical purposes. With alcohol of sp. gr. 0.970 (21.31 per cent. abs. alcohol by weight) he

* Drug. Circ. 1887-104 from Pharm. Central halle.

† Where last cited.

‡ Plant Analysis Eng. Ed. 1884-191.

‖ Proc. Amer. Phar. Ass. 1878-806.

found 2617½ parts necessary to dissolve one part strychnine and 37.3 parts to dissolve one part of brucine. This degree of concentration he recommends and doubtless it is one of the best yet offered. In this connection, the writer wishes to record a series of negative experiments on the estimation volumetrically of the chlorine contained in the chlorides from a known weight of the alkaloids, making this the basis of an indirect determination of them. They were dissolved in a little chloroform, and chloroformic solution of hydrochloric acid was added until slightly acid. The solution was then evaporated repeatedly with fresh chloroform and alcohol in order to free the alkaloids from mechanically adhering acid. The chlorides when dissolved in water were titrated with silver nitrate ($\frac{N}{100}$) using potassic (normal) chromate as an indicator. The reaction seems to be progressive and with the dilute standard solutions required it was not possible to arrive at the end reaction with sufficient exactness to enable calculations approaching the truth to be made. Repetition of these experiments at a later period confirmed the first opinions. It was again tried using Volhard's sulphocyanide method of estimating the chlorine. This is carried out by adding an excess of silver nitrate solution, shaking vigorously and after adding a few drops of ammonio-ferric alum as an indicator, titrate back with ammonium sulphocyanide. But results were no better. The molecular weights of the two alkaloids are close together being respectively for strychnine and brucine 334 and 394 with a difference of only 60 and 9.151 parts of strychnine will combine with one part of hydrochloric acid while 10.794 parts of brucine will combine with the same amount. The difference between them is therefore slight and as the alkaloids are usually presented under the conditions of assay in small amounts necessitates any indirect process to be of great accuracy and precision in order to be of any value. Volumetric methods require very dilute standard solutions and indicators, and these latter seem to be difficult to ob-

tain of sufficient sensitiveness, especially in the acid metric determinations.

DUNSTAN & SHORT:

Nux Vomica, Drug, Assay.
Pharm. Jour. and Trans. [3] XIII-665; [3] XV-156 [Year Book 1883-233; Amer. Drug. 1883-124].

Nux Vomica, Extract.
Pharm. Jour. and Trans. [3] XIII-443 [Year Book 1883-475; 1884-273; Amer. Jour. Phar. 1883-268].

Nux Vomica, Tincture.
Pharm. Jour. and Trans. [3] XIV-292; [3] XIV-441 [Year Book 1883-476; Amer. Drug. 1884-5].

Nux Vomica, Standard Extract.
Phar. Jour. and Trans. [3] XIV-621 [Year Book 1884-274; Drug. Circ. 1884-52].

Nux Vomica, Standard Tincture.
Phar. Jour. Trans. [3] XIV-622 [Year Book 1884-273; Drug. Circ. 1884-52].

LYONS, A. B.:

Nux Vomica, Extract, Tincture, etc.
Proc. Mich. S. P. A. 1885-172 [Drug. Circ. 1885-253].

Nux Vomica, Drug, Assay. Drug. Circ. 1886-137.

CONROY, M.:

Nux Vomica, Tincture.
Phar. Jour. and Trans. [3] XIV-461.

DIETERICH, E.:

Nux Vomica, Extract, Assay.
Amer. Jour. Phar. 1887-179; Year Book 1887-244 (from Pharm. Central halle).

SCHACT, G. F.:

Mayer's reagent for estimation of total alkaloids in tinctures, etc. Year Book 1884-275. (See also Lyon's paper Drug. Circ. 1886-137; Snow Proc. Mich. S. P. A. 1888-114 for titration equivalent of mixed alkaloids).

SIMONSON, W.:

Nux Vomica, Powdered Extract.
Phar. Era 1888-287; Amer. Drug. 1888-122.

YEARGER, E. J.:

Nux Vomica, Tincture U. S.
Amer. Jour. Phar. 1886-291.

PASSOLT, H. A.:
Nux Vomica, Tinctures, U. S.
Proc. Mich. State Phar. Ass. 1888–101.

REMARKS.

PROF. PRESCOTT: I would like to ask Mr. Snow whether he is aware of control analyses having been made to determine the exactness of the Assay Method he employs. I don't ask this in any doubt as to the practical usefulness of this method, but simply because I believe that its degree of exactness should be made the subject of experiment if it has not been.

MR. SNOW: I don't remember of having seen report of such control analyses. The process is that of Dunstan & Short, with slight modifications.

PROF. PRESCOTT: Dunstan & Short's process recovers larger quantities of alkaloids from nux vomica than have been recovered previousiy. From the evidence I believe these larger quantities to be nearer the truth than previous reports. However, the one or two washings of the watery solution with chloroform, as used by Dunstan & Short, probably does not recover the entire alkaloid; and the residue weighed as total alkaloid probably contains some foreign matter. The waste on one hand may fairly balance the impurity on the other. To bring such a method to conclusive test is not without difficulty. To obtain nux vomica strictly exhausted of alkaloid is a task, and to add weighed strychnine in such a way that it shall offer the natural resistance to extraction is another task.

Estimation of Glycerine in Glycerine Soaps.

BY LOUIS J. SPENKER.
SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

Among the soaps under examination were transparent soaps claiming to contain a certain per cent. of glycerine,

and the different kinds of glycerine soaps of the market, some of which were transparent, others not.

The method used is as follows:*

Take 5 grams of the soap, dissolve in hot water, decompose with dilute sulphuric acid, allow to stand for half an hour, then separate the isolated fatty acids by filtration and wash the filter with a little water, neutralize the filtrate with barium carbonate and filter, wash the filter with a little water, and evaporate the filtrate on a water bath at 100° C. to a syrupy consistence. This residue consists of the glycerine and certain organic matters that may be present, such as coloring matter, etc. The glycerine is extracted with a mixture of ether 1 part and 95 per cent. alcohol 3 parts. On filtering, the filter is washed with a little of same solvent, the filtrate evaporated on a water bath, and extraction repeated twice more. Then evaporate to a constant weight, place in a desiccator, and weigh. From the weight of the glycerine calculate the per cent.

Of the twelve samples examined only six were found to contain glycerine.

No. 1. White Glycerine Soap, hard, easily powdered, no claim as to quantity. Found no Glycerine.

No. 2. Glycerine Soap, hard, yellow color, no claim. No Glycerine.

No. 3. Glycerine Soap, hard, easily powdered, chocolate-brown color, no claim. No Glycerine.

No. 4. Glycerine Soap, hard, transparent, very brittle, no claim. No Glycerine.

No. 5. Transparent Glycerine Soap, very hard and brittle, claim of 30% glycerine. No Glycerine.

No. 6. Pure Glycerine Soap, very hard and brittle, claiming 50% glycerine. No Glycerine.

No. 7. Bay-berry Glycerine Soap, soft, of green color, wrapped in tin foil. No claim. Found 36.4% Glycerine.

* Slightly modified from that given in Prescott's Organic Analysis, p. 327.

No. 8. White Translucent Glycerine Soap, soft. No claim. Found 23.87% Glycerine.

No. 9. Transparent Glycerine Soap, yellow color, not very hard. No claim. Found 17.67% Glycerine.

No. 10. Transparent Glycerine Soap, hard, reddish color. No claim. Found 9.% Glycerine.

No. 11. Transparent Glycerine Soap, very hard and brittle, reddish color, claiming 33%. Found 6.86% Glycerine.

No. 12. Glycerine Soap, "33% pure glycerine," not quite transparent. Found 5.91% Glycerine.

Volumetric Estimation.

The following volumetric method for the estimation of glycerine is proposed by Dr. Otto Hehner (Jour. Soc. Chem. Industry, 1889, p. 3.):

Three solutions are required. First, 74.86 Gms. pure potassium dichromate and 150 cc. strong sulphuric acid in one liter. Second, 120 Gms. ammonio-ferrous sulphate in one liter, the strength being adjusted exactly to that of No. 3. Third, one liter containing 100 cc. of No. 1. To carry out the assay add to the solution, which must not contain more than about 0.2 Gms. of glycerine, one tenth its volume of strong sulphuric acid and 25 cc. of solution No. 1, heat the mixture on the water-bath two hours, then add from a burette a slight excess of solution No. 2, and finally titrate back excess with solution No. 3, using ferricycanide as an indicator. Divide the number of cc. of solution No. 3 thus used, by 10, and deduct from the number of cc. of No. 2 consumed; subtract the remainder from 25, and the result will be quantity of glycerine in centigrams.

The process and calculations are based upon the fact that solutions of glycerine containing more than one part per thousand, when heated two hours in presence of the dichromate and sulphuric acid, produce a constant reducing effect, one part of the glycerine reducing 7.486 parts of the dichromate. If alcohol is present in the solution

under examination this must be removed by evaporation.

The results from Hehner's method were not satisfactory. After extracting the glycerine from the soap, 25 cc. of solution No. 1 was added to it and boiled for two hours, then an excess of solution No. 2 was added, the resulting solution was highly colored with chromic sulphate and ferric sulphate. In titrating back the excess of solution No. 2 it was very difficult to distinguish the end reaction with ferricyanide as an indicator. In one case I diluted the solution 10 times its volume, and then the end reaction was not attainable. The titrations must be made rapidly, as the ammonio ferrous-sulphate is easily oxidized by the air, especially when a large surface is exposed.

By the method first given in this paper, and used in the estimations, I have been able to obtain results as close as 1% in working duplicates of the same sample.

In neutralizing the sulphuric acid after decomposition, sodium carbonate might be used instead of barium carbonate, but makes the solution heavy with sodium sulphate, and hard to evaporate. Barium carbonate is better because it forms an insoluble sulphate, while the reagent is also insoluble and adds nothing to the solution when in excess.

A good reliable qualitative test for glycerine is to treat the substance to be treated with a little Pyrogallic acid, and a few drops of dilute sulphuric acid, then boil, when the mixture will turn red. Now add a little stannous chloride and a beautiful violet red is produced (Zeitsch. Anal. Chem., 23, 456.)

REMARKS.

MR. BASSETT: In view of the paper, I think it ought to be decided that it would be well for dealers to buy soaps as glycerine soaps that make no claim to be such.

MR. GUNDRUM: It would seem that soap that really contained the most glycerine would probably be the hardest to sell, as it would come wrapped in tin foil.

Adulterations of Oil of Turpentine.

BY F. E. PARKINSON,

SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

It is well known that at present the most frequent adulterations of this article are the lighter fractions of petroleum. A petroleum product is sold under the name of "turpentine substitute," and other less suggestive names are adopted, such as "shale naphtha," "resin spirit," and "coal tar solvent."

The application of the flash test to the turpentine oil, as a means of detecting presence of light petroleum liquids, is an obvious ready resource, suggested some time ago,* but not subjected by any one to a critical trial so far as the writer has been able to find reported.

Using the Michigan Tester, or the New York Tester, and taking a random sample of petroleum benzine, the following results were obtained:

	Flashing Point.
Oil of Turpentine, alone	91.8° F.
The same with 1% of the benzine	84.8°
" " " 2% " " "	81.3°
" " " 3% " " "	78.3°
" " " 5% " " "	76.
" " " 7% " " "	72.

Trial tests of Aniline Dyes, and of Alkaloids were made, with pure turpentine, clear benzine, and admixture of both, to find, if possible, convenient test substances revealing the presence of benzine by the difference between its solvent power and that of petroleum. In this work resort was had to the valuable report of John D. Riker upon "Color Reactions of Aniline Dyes upon Essential Oils," contributed last year to this Association, and

* REDWOOD, 1884: *Phar. Jour. Trans.* [3] *14*, 500, 625.

published in the proceedings for 1888, pages 140 to 144. Mr. Riker did not include turpentine oil among the essential oils of his tests. In extending his methods, or rather in applying tests upon a plan similar to his, the writer proceeded as follows: Trials were made with

A, *turpentine alone;* B, *turpentine 85%, and benzine 15%;* C, *benzine alone.*

Each was treated with a five per cent. solution of the dye in diluted alcohol, adding 3 or 4 drops of the dye solution to about two fluid drachms of A, B, or C,—agitating, and leaving at rest. Results were obtained as follows:

Gentian Violet:
A, no change of color, an emulsion.
B, color lighter than the original.
C, color is wholly precipitated upon side of test-tube.

Nigrosin:
A, turns from black to dark blue, with opalescence, the color substance being gradually precipitated.
B, turns slightly blue, without opalescence, and with greater precipitation than in A.
C, color not dissolved at all.

Magenta:
A, is colored purple, pink, and lastly pale rose, with strong blue fluorescence. Heated purplish-black.
B, no color reaction.
C, no color reaction.

Methyl Green:
A, emulsion clearing to very light green.
B, lighter green, without emulsion.
C, no emulsion and no color.

Berlin Blue:
A, very slowly dissolves to very pale blue.
B, a slight blue color, more miscible than A.
C, no change of color, in the cold; heated, slowly colors dark brown.

Hofmann's Violet:
A, color readily taken up without change. Heated, the color separates gradually, leaving opalescence.
B, no change or absorption of color.
C, like B.

Martius Yellow:	A, takes the color slowly. Heated, dark orange. B, takes the color quickly. Heated, orange. C, takes the color. Heated, turns brown.
Vesuvian Brown, *with Guaiac resin ten grains in fine powder:*	A, color changes to yellow; heated, red; shows surface tension. B, color to slight yellow; heated, a dark red, then greenish. C, color not changed; no surface tension.
Gentian Violet, with Guaiac, *plus 10 minims Fehling's sol.:*	A, changes to brownish-green. Dark brown when heated. B, changes to violet. C, changes to brownish-green.
Vesuvian Brown, with Guaiac, and Fehling's solution:	A, no change. B, changes to dark green (distint). C, changes to dark olive green.
Alcoholic sol. Guaiac, plus 3 drops sulphuric acid:	A, changes from colorless to deep red. Brown when heated. B. changes to blackish-brown. C, changes to olive-green (distinct).
Benzoin, 10 grains, in dilute alcohol, 2 f. dr.:	A, color changes from brown to cherry red. B, changes to brownish-black. C, no change in color.
Sandarac, Scammony, Ammoniac, Myrrh, and Jalap, separately:	Results negative.

REMARKS.

MR. PARSONS: I would like to ask if it was found in the investigation that the article of turpentine was heavily adulterated? The question came up last spring and created considerable excitement in the drug trade in New York.

PROF. PRESCOTT: I think he did not examine a very large portion of the samples on the market.

MR. PARSONS: The reason why I asked it was that I understood he found trouble in obtaining samples, in fact I understood that he got none.

MR. STEVENS: I think that is so. I think he worked largely on the tests.

Lactic Acid,--its Sources, Commercial Quality, and Therapeutic Uses.

BY EDWIN T. BODEN,

SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

Medicinal lactic acid is always "fermentation lactic acid," an alpha-hydroxy-propionic acid, CH_3. CH(OH) CO_2H. It is obtained for use by the lactous fermentation of a sugar or a starch, seldom or never by utilizing the whey of milk. The most economical mode of production seems to be that from corn meal, according to the method of AVERY.* However produced, the purification requires care, especially for exclusion of butyric acid. In 1882 the formation of lactic acid from sugar by action of caustic alkali was reported by KILIANI.† By the method of Avery I prepared the acid of a degree of purity meeting the requirements of the U. S. Ph. and met no difficulties.

The pharmacopœial acid, of 75 per cent. strength, is fairly guarded by the tests given in the last Revision. It should be added to the description that it is very hygroscopic. The test for glycerine is by heating with excess of zinc hydroxide and extracting with absolute alcohol, when the residue left on evaporation of the alcohol should not have a sweet taste. The test of Ph. Germ. Commission one more convenient of application, directs that, on add-

* CHARLES E. AVERY, 1882: Proceedings Society of Arts, Boston; *New Remedies*, New York, *11*, 234; *Phar. Jour. Trans.* [3] *13*, 109; *14*, 82; *Proc. Am. Phar. Assoc.*, *31*, 252.

† H. KILIANI, 1882: *Ber. d. chem. Ges.*, page 699; *Am. Jour. Phar.*, *54*, 216; *Phar. Jour. Trans.* [3] *14*, 130.

ing one volume of the lactic acid, drop by drop, to two volumes of ether, neither transient nor permanent opalescence should be perceptable. A test for oxalic acid, by adding calcium chloride solution, should be provided.

In the assays of lactic acid of the market, made by the writer, and reported below, the total acid was determined as lactic acid, volumetrically, by a standard solution of soda, in each case on triplicate portions by weight. The specific gravity was taken, by use of a specific gravity bottle, both at 15°C. and at 25°C.

Sample.	Spec. Grav.		Per Cent.	Hydrochloric.	Sulphuric.	Glycerine.
	15°C.	25°C.				
1	1,204	1,196	72.	traces.	none.	none.
2	1,217	1,204	75.	5%	"	a little.
3	1,214	1,201	76.8	none.	"	none.
4	1,214	1,201	76.8	none.	"	none.
5	1,215	1,202	77.	none.	"	none.
6	1,203	1,196	73.9	none.	"	none.

A table of percentages of lactic acid corresponding to specific gravities at 15°C. is given in Hager's Commentary, I. 134.

Lactic acid is in considerable demand for production of ready-made lactates and lacto-phosphates. For internal administration, as a free acid, by direction of the physician, it is but little used, and even less than heretofore. In local application, as a caustic of limited intensity, it is sometimes in demand, and claim for its special value has been made by good authority. Mosetig, and Jellinck, and Bum have claimed for concentrated lactic acid the power of removing morbid or malignant growths while sparing healthy tissues. Spitzer, and Herman, after investigation, do not sustain this claim for the sparing of healthy tissues by lactic acid.

Coloring Matters of Clothing.*

BY ALBERT F. VOGEL,

SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The analysis of fabrics for the dye-stuffs with which they have been colored is required sometimes as an aid in the valuation of the goods, and sometimes for sanitary ends. The qualitative determination of coloring matters of fabrics is, in general, satisfactory, trustworthy and not difficult. Quantitative determinations of colors upon fabrics, for the most part, are not easily made accurate. There are now a good number of well-tried systematic schemes, for analysis of the most common color substances, reds, yellows, greens, blues, and violets, the dyes of each color being separately sought for. Of these the schemes of Witt,† Stein,‡ and Fol§ are most used.‖ Witt gives methods for reds, yellow or orange colors, greens, blues, and violets; Stein for red colors and for blue colors; and Fol for blues, yellows, reds, greens, and violets. In these analyses, the red flannels were examined by Stein's method, and the results verified by other tests. In ribbons, the method of Witt was employed, coal-tar dyes being chiefly in question.

Results were obtained as follows:

No. 1, Silk, Naphthalene-Carmine.
" 2, " Acid Azo-Rubin.
" 3, " " " "

* This paper accompanies the presentation of fifteen samples of dyed cloths, marked with names of the dyes determined in them by analysis.

† OTTO N. WITT, 1886: *The Analyst, 11,* 111.

‡ W. STEIN, 1870: *Zeitsch. anal. Chem., 9,* 520.

§ F. FOL, 1874: *Ding. polyt. Jour., 212,* 520.

‖ Prescott's Organic Analysis, 1887.

No. 4, Silk Eosin.
" 5, " "
" 6, " "
" 7, " Acid Magenta.
" 8, " " "
" 9, " Xylidine Ponceau.
" 10, Flannel, Alizarin.
" 11, " Sandal.
" 12, Worsted, Prussian Blue.
" 13, " " "
" 14, " Logwood Blue.
" 15, Flannel, " "

Several attempts were made to obtain flannels colored with cochineal, but without success. A suit marked as "Guaranteed to be colored with pure cochineal" was found upon analysis to be colored with alizarin.

Experiments upon quantitative methods were made as follows: For estimation of cochineal by the spectroscope, colorometrically. The aqueous solution of cochineal, made alkaline with ammonia, as is well-known, gives two vertical absorption bands between D and E, resembling those of the oxy-hæmoglobine of the blood. A known solution of cochineal was diluted volumetrically until the limit of recognition was obtained in the spectroscope. Then a solution of the cochineal to be tested was diluted, under like conditions, until its limit of identification was obtained in the same instrument. The ratio of dilution is directly as the ratio of strength. Penny's method, by oxidation of the cochineal with ferricyanide in alkaline solution, comparing with standard cochineal solution, was tried. Permanganate was tried as a substitute for the ferricyanide. Neither gave as satisfactory results as were obtained with the spectroscope.

For estimation of indigotin, as an index of the value of indigo,* several methods were tried. The best results were obtained by the very simple operation of C. T. Lee,

* C. H. WOLF, 1878: *Zeitsch. anal. Chem.* 17, 65.

in which the indigotin is vaporized. Of the indigo 25 grams are placed in a platinum crucible and heated until it ceases to lose weight, avoiding too high heat. The difference in weight is taken as indigotin. Duplicate estimations upon each of two samples did not vary one per cent. in either. The method by dispersion of indigo color through action of sodium bisulphite was faithfully tried and found untrustworthy. The quantity of bisulphite consumed appears to vary with length of exposure of the solution to the air, and with the rate of addition.

The writer was able to obtain but one piece of colored cloth supposed to have acted as a poisonous dye. A patient during recovery from pneumonia, and directed by the physician to wear red flannel upon the chest, sufferred an eruption resembling eczema. On analysis, however, the color was found to be that of alizarin. The physiological effects of local application of coal-tar dyes has not been generally investigated. Differences of the reaction of the perspiration, whether acid or not, as Mr. Crookes has suggested, may explain the uncertainty of poisonous effects.

Assay of Preparations of Colchicum Root and Seeds.

VOLUNTEER PAPER.

BY H. W. SNOW, PH. C.

Very little literature on the assay of this drug is to be found outside of some investigations bearing on the results of titrations with Mayer's reagent. Dragendorff on the authority of Jorgensen gives equivalents for the results of titrations but other observers have obtained different and widely divergent figures. Probably the best work is that of Lyons who as the result of considerable experience

gives tables* for the interpretation of the results of titration, the acidity and degree of dilution being strictly defined. He states results by weighing to confirm results by titrations. My own observations are decidedly opposed to the use of either Mayer's reagent, phosphomolybdic acid or platinum chloride for estimations of colchicine and would caution all who are not thoroughly familiar with the action of these reagents on known material to be cautious how far they place confidence in the results of work on unknown material. In the absence of a satisfactory method of gravimetric assay of this drug, the writer feels justified in recommending the following process to the attention of pharmacists. Its application depends on the following characteristics of the alkaloid.

1. Colchicine is soluble in chloroform and insoluble in petroleum ether.

2. It is withdrawn from either acid or alkaline solutions by washing with ether or chloroform but most readily from alkaline.

3. Its solution in chloroform is precipitated by great excess of petroleum ether but not by moderate amounts.

4. It is fairly soluble in a mixture of one volume chloroform and four volumes of petroleum ether.

5. The alkaloid is completely and perfectly removed by two or at most three washings of the above liquid with slightly acidulated water, the first washing being with one per cent. sulphuric acid.

PROCESS.

Ten grammes of drug in fine powder are introduced into a flask of 125 c. c. capacity. Over this is poured 18 c. c. of chloroform and after agitating thoroughly, introduce 2 c. c. of absolute alcohol, containing five or ten drops of strong ammonia. Shake thoroughly for about one-half hour and then introduce 80 c. c. of petroleum ether (boiling point about 105 deg. to 110 deg. F.) shake thoroughly

* Manual Pharm. Assaying 77 et. seq.

and macerate twelve or fifteen hours with frequent agitation. Decant 50 c. c. and wash once with 20 c. c. of one per cent. sulphuric acid and then with two portions of 10 c. c. each of water. The three washings may if necessary be filtered through a small filter paper (two inches in diameter) in the order in which they were received and the paper finally washed with a small amount of water. The mixed washings after rendering carefully alkaline may be washed with three successive portions of chloroform which is to be evaporated to dryness, the residue again dissolved in chloroform and transferred with washing of the beaker and *without filtering* to a weighed beaker, evaporate, dry and weigh. The alkaloid obtained should be soluble in dilute sulphuric acid. As yet experience with this assay process is limited, being confined to the assays of a few fluid extracts and solid extracts, but the general experience in the use of ammoniated solvents indicates that it is deserving of careful consideration. Fluid extracts and solid extracts are still better assayed by it and it is only necesary to incorporate them with pumice stone, dry, powder and treat as drug.

Ether:. Methods for its Examination, and Tests of its Quality.

BY H. J. FROST,

SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The principal labor in this investigation was devoted to critical trial of proposed qualitative and quantitative tests of constituents of commercial and medicinal grades of ether. The details of the tests undertaken will be found in the notes to the tabular report of the analyses. Many of the tests evidently have but a conditional value. Ten samples were analyzed. They were all obtained from

drug stores in Michigan, and from a number of towns. From statements of those who dispensed them, they were in all obtained from seven manufacturing houses. They are severally entitled, in the table below, just as they were named upon the labels under which they were obtained by the retailing pharmacist.

TABLE I. Results by the Tests of the U. S. Pharmacopœia.

Number and Label.	Sp. Gr. at 15°C. Note 1.	Soluble in water volumes.	Boiling point, C. Note 2.	Reaction. Note 3.	Fixed Residue per cent.	Foreign odor. Note 4.	Strength test. Note 5.
1. Sulphuric Ether (U.S.P.)	.7542	5.75	37.5	neut.	.0044	none	7.75
2. Sulphuric Ether ------	.7481	7.	37.	neut.	.0041	none	7.55
3. Stronger Ether ------	.7226	9.25	34.	neut.	none	none	9.5
4. Stronger Ether ------	.7277	9.	34.	neut.	traces	none	9.
5. Sulphuric Ether (U.S.P.)	.7568	6.	38.	neut.	.0045	strong	8.5
6. Sulphuric Ether (conc.)	.7311	6.	35.	neut.	traces	slight	9.9
7. Sulphuric Ether (U.S.P.)	.7498	5.25	37.	neut.	.0044	slight	8.5
8. Sulphuric Ether (conc.)	.7258	9.	36.	neut.	traces	slight	9.5
9. Sulphuric Ether (U.S.P.)	.7561	5.5	38.	neut.	.0025	strong	8.5
10. Sulphuric Ether (washed)	.7184	9.5	37.5	neut.	none	none	9.8

TABLE II. Tests by Proposed Methods for Alcohol, Water, Aldehyde, Methyl compounds.

No.	Alcohol.			Water.				Aldehyde.		Methyl'ic.
(See Table I)	Boettger's. Note 6.	Stefanelli's. Note 7.	Frederkl'g's Note 8.	Napier's. Note 9.	Liebig's. Note 10.	Mann's. Note 11.	Boettger's. Note 12.	Liebig's. Note 13.	Tollen's. Note 14.	Langbeck's. Note 15.
1	yes	yes	6.	yes	yes	yes	yes	none	none	yes
2	yes	yes	6.5	yes	yes	yes	yes	none	none	no
3	slight	no	5.	no	no	no	no	none	none	no
4	slight	no	5.	no	no	no	no	none	none	no
5	yes	yes	5.25	yes	yes	yes	yes	none	none	no
6	slight	no	5.	no	yes	no	no	none	none	no
7	yes	yes	5.25	yes	yes	yes	yes	none	none	yes
8	slight	no	4.7	no	yes	no	no	none	none	no
9	yes	yes	5.	yes	yes	yes	yes	none	none	yes
10	slight	no	4.75	no	no	no	no	none	none	no

TABLE III. Tests for Acids, Hydrogen Peroxide, Ozone, Petroleum Ether.

No. (See Table I)	Acids.		Hydrogen Perioxide.			Ozone.	Petrol. Ether.	Conclusions.
	Sulphuric.	Acetic.	Dunstan's. Note 16.	Boettger's. Note 17.	Schönbein's Note 18.	Boettger's. Note 19.	Vitali's. Note 20.	Per cent. Ethyl Oxide. Note 21.
1	none	none	-------	-------	-------	-------	-------	75
2	none	none	-------	-------	-------	-------	-------	76
3	none	none	-------	-------	-------	-------	-------	94
4	none	none	-------	-------	-------	-------	-------	94
5	none	none	-------	-------	-------	-------	-------	78
6	none	none	-------	-------	-------	-------	-------	96
7	none	none	-------	-------	-------	-------	-------	77
8	none	none	-------	-------	-------	-------	-------	95
9	none	none	-------	-------	-------	-------	-------	80
10	none	none	-------	-------	-------	-------	-------	94

Note 1.—The specific gravity was taken in a specific gravity flask, with much care as to temperature. These figures bear a near but not exact relation to strength, that is, per cent. of absolute ether.

Note 2.—"It [stronger ether] boils at 37° C. (98.6° F.)" "It should boil actively, in a test-tube half filled with it and held a short time in the hand, on the addition of small pieces of broken glass."

Note 3.—"If a piece of pale blue litmus paper moistened with water be immersed ten minutes in a portion of the ether."

Note 4.—"On evaporating a portion dropped upon blotting paper, no foreign odor should be developed."

Note 5.—"When 10 c. c. are agitated with an equal volume of glycerine in a graduated test-tube, the ether layer, when fully separated, should not measure less than 8.6 c. c." The measure obtained is given in the table.

Note 6.—Boettger's test for alcohol in ordinary ether.* A piece of solid potassium hydrate is added, and the whole set aside for twenty-four hours. In presence of alcohol

* R. Boettger, 1872: Proc. Am. Phar. Assoc., *21*, 327.

the fragment will be colored yellowish to yellowish-brown, proportional to percentage of alcohol. Replies as to presence of alcohol are given in the table.

Note 7.—Stefanelli's test for alcohol. The addition of aniline violet, not soluble in pure ether, readily soluble in alcohol. Affirmative and negative results are given in the table.

Note 8.—A little magenta is shaken up with water to obtain a colored aqueous liquid, this is shaken with just sufficient ether to sature it, and excess of ether removed. Of this ether saturated and colored water, 10 c. c. are placed in a cylinder, graduated in tenths c. c., and 10 c. c. of the sample added. The cylinder is stoppered, shaken, and set at rest for the ether to separate, when the volume of the latter is read off. Results are given in c. c. in the table.

Note 9.—Ten c. c. of the ether under examination are placed in a test-tube, a fragment of magenta added, the tube corked, and set aside. If the liquid does not become colored, alcohol is absent; if it becomes colored, alcohol is present. Affirmative and negative replies are given in the table. Further trial, colorometrically, for quantity of alcohol, may be made as follows: Of ether which has been made absolute by treatment with calcium chloride, 10 c. c. are taken, with a fragment of magenta, as above, and then alcohol is added in measured quantity from a burette until the color, after standing, equals the color obtained from the sample under analysis.

Note 10.—Filter paper is wet with solution of cobalt chloride and dried. In anhydrous ether it remains blue, but if wet with aqueous ether it turns rose-red. The affirmative and negative replies as to presence of water, by this test, are given in the table.

Note 11.—Mann's test.* Two parts of citric acid and

* C. Mann, 1880: *Ding. polyt. Jour.*, *236*, 336; *Am. Jour. Phar.*, *52*, 546.

one part of molybdic acid are heated to incipient fusion, the mass then warmed with forty parts of water. Filter paper is wet with this solution and dried at 100°C., when it has a blue color. This color is not affected by ether or alcohol, but is discharged by water admixture in ether, in proportion to percentage, and more rapidly on warming. Affirmative and negative replies by this test are given in the table.

Note 12.—Boettger's test for water.* An equal volume of carbon disulphide is added to the ether, with agitation, when turbidity results from even small proportions of water. Affirmative and negative replies by this test are given in the table.

Note 13.—Ammoniacal solution of silver nitrate is added to the ether, when, according to this test, silver will be reduced to a mirror on the test-tube if aldehyde be present.

Note 14.—The test is made as last above with further addition of caustic soda solution.

Note 15.—Langbeck's test for the methyl group in ether.† To ten volumes of the ether under examination, one volume of a 1.7% solution (decinormal) of silver nitrate is added, and the mixture set aside twenty-four hours. Methylic compounds are then revealed by a reddish-violet coloration between the liquid strata, or, when the impurity is abundant, a visible precipitate of silver. Affirmative and negative results are given in the table. But it is evident that other and more common reducing agents than methylic compounds, are liable to cause this reduction.

Note 16.—Dunstan and Dymond's test.‡ A sample of the ether to be tested is shaken with a little of a very dilute solution of potassium chromate acidified with sul-

* R. BOETTGER, 1872: *Am. Jour. Phar.*, *44*, 539.

† 1878: *Chemiker Zeitung*, No. 39; Year-book Pharm., 1879, 293.

‡ 1887: Phar. Jour. Trans., April, 1887, p. 841.

phuric acid, when, if hydrogen peroxide be present, the ether will separate with a blue color, due to the formation of perchloric acid. Only negative results were obtained with the ten samples.

Note 17.—Treatment with a mixture of iodide of cadmium and starch-paste, with a very little ferrous sulphate solution. Blue color indicates peroxide of hydrogen. Negative results were obtained with all the samples.

Note 18.—Solutions of ferric chloride and potassium ferricyanide, in a drop or two of their mixture, are added. Blue color, by reduction, indicates hydrogen peroxide. The ten samples gave negative results.

Note 19.—Boettger's test for ozone. Filter paper is wet with solution of thallous oxide [hydroxide], prepared by precipitating sulphate of thallium with baryta water. The paper, when dried, is applied to the sample, when ozone will turn it dark brown. With the ten samples, only negative results were obtained.

Note 20.—Vitali's test for petroleum ether as an adulteration in ordinary ether.* The article under examination is shaken with iodine. This colors ether yellow; petroleum ether pink. With the ten samples only yellow tints were obtained.

Note 21.—This approximate estimation of strength is drawn from (1) the U. S. Ph. strength test [note 5]; (2) the gravity [note 1]; (3) the boiling point [note 2]; (4) the trial by water [note 8]; together with results of qualitative tests.

* As to this adulteration, *The Analyst*, 1885, vol. 10, p. 95.

The Analysis of Chemicals Sold as Strictly Pure.*

(Being a portion of the report of the Committee on Adulterations omitted on page 40.)

BY O. C. JOHNSON.

ARSENIC ACID.—Six lots were pure. Two contained arsenious acid.

ARSENIOUS ACID.—Nine lots all pure.

OXALIC ACID.—Eight lots were pure. One contained a sulphate.

PHOSPHORIC ACID.—The imported solution was always found pure. The stick form, frequently contained sodium phosphate.

CHROMIC ACID.—Nine lots all contained potassium sulphate. Probably the strictly chemically pure cannot be found in the market. It can however easily be made.

ANTIMONOUS CHLORIDE.—Nine lots, all pure.

AMMONIUM ARSENATE.—Five lots, all found pure.

AMMONIUM CHLORIDE.—Twelve lots, all found pure.

AMMONIUM CARBONATE.—Twelve lots, all were found pure.

AMMONIUM OXALATE.—Twelve lots, all were found pure.

ALUMINIUM CHLORIDE.—One lot, made in the humid way was found pure. One made by sublimation contained ferric chloride.

BARIUM CHLORIDE.—Twelve lots were pure. One contained lead chloride.

BARIUM CHROMATE.—Two lots were pure. One contained barium sulphate.

BARIUM HYDROXIDE.—Seven lots, all were pure.

* This work was done without any expectation of publishing the results. The analysis was made at the time the chemicals were purchased by the University. The greater portion of them were manufactured in Germany. Probably none of them were intentionally adulterated; but the impurities were due to carelessness in making. In all cases the *chemically pure* articles were ordered.

BARIUM SULPHATE.—Two lots were pure and four contained barium chloride.

BISMUTH CHLORIDE.—Eight lots, all contained traces of silver.

BISMUTH CARBONATE.—Seven lots, all contained traces of silver.

CADMIUM CHLORIDE.—Five lots were pure. One contained a sulphate.

CALCIUM OXALATE.—Two lots, both were pure.

CALCIUM SULPHATE.—Five lots, all were pure.

CALCIUM CHLORIDE (Crystalized).—Twelve lots, all were pure.

CALCIUM CARBONATE.—Six lots were pure. Two contained calcium chloride.

CHROME ALUM.—Six lots, all found pure.

CHROMIC HYDROXIDE.—Five lots were pure. One contained chromium chloride.

COBALT NITRATE.—Five lots were pure. Two contained an iron salt.

COPPER OXIDE.—Six lots were pure.—Two contained copper chloride.

COPPER SULPHATE.—Seven lots were pure. One contained copper chloride.

COPPER PHOSPHATE.—Three lots, each contained copper chloride.

FERRIC OXIDE.—Four lots were pure. One contained ferric chloride.

FERROUS SULPHATE.—Twelve lots, all contained an exceedingly faint trace of manganese.

LEAD ACETATE.—Ten lots, all pure but two of them were slightly basic.

LEAD CARBONATE.—Four lots were pure. Two contained lead chloride.

LEAD NITRATE.—Five lots were pure. Two contained an iron salt.

RED LEAD.—Ten lots all were pure, except traces of lead monoxide.

LEAD PHOSPHATE.—One lot, contained lead chloride.

LEAD SULPHIDE.—One lot contained lead chloride and one much organic matter.

LEAD SULPHATE.—Four lots all pure.

MAGNESIUM SULPHATE.—Ten lots pure. One contained magnesium chloride.

MANGANESE PEROXIDE.—Ten lots, all contained more or less manganese chloride. Probably the pure article is not found in the market.

MANGANOUS SULPHATE.—Eight lots were pure. One contained manganous chloride.

MERCUROUS CHLORIDE.—Ten lots, all found pure.

MERCURIC CHLORIDE.—Ten lots, all found pure.

MERCURIC OXIDE.—Ten lots, all found pure.

MERCURIC SULPHIDE.—Four lots of the red were pure. Three lots of the black, contained mercuric chloride.

POTASSIUM ARSENATE.—Eight lots were pure. One contained potassium chloride.

POTASSIUM CARBONATE.—Twelve lots, all were found pure.

POTASSIUM ANHYDROCHROMATE.—Twelve lots were pure. Two contained potassium sulphate.

POTASSIUM SULPHATE.—Nine lots, all were pure.

POTASSIUM BROMIDE.—Ten lots were pure. One contained a trace of potassium iodide.

POTASSIUM CHLORATE.—Ten lots, all found pure.

POTASSIUM CHLORIDE.—Seven lots, all were pure.

POTASSIUM IODATE.—Four lots were pure. Three contained free iodic acid.

POTASSIUM IODIDE.—Seven lots were pure. Three lots liberated iodine after being kept three months.

POTASSIUM HYDROXIDE —Three lots were pure. Seven contained potassium chloride.

POTASSIUM PERMANGANATE.—Nine lots were pure. One contained potassium chloride.

POTASSIUM NITRATE.—Eight lots were pure. Three contained potassium chloride.

POTASSIUM NITRITE.—Twelve lots, all contained a large amount of potassium chloride.

POTASSIUM OXALATE.—Four lots, all pure.

SILVER NITRATE.—Ten lots, all pure.

SODIUM CARBONATE (normal dry).—Ten lots were pure. Three contained a chloride.

SODIUM CARBONATE (acid).—Ten lots were pure. Three contained sodium chloride.

SODIUM CHLORIDE.—Ten lots were pure. Three contained a sulphate.

SODIUM PHOSPHATE.—Ten lots, all pure.

SODIUM HYDROXIDE.—Four lots made from metallic sodium were strictly chemically pure. All other lots were found to contain more or less sodium chloride.

Sugar of Milk and Its Manufacture.

BY J. THOMPSON,

SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

Sugar of milk was discovered in 1619[1], since then it has been known both to the practical and scientific world, as a by-product of the Swiss dairy.

Switzerland[1] has always been the chief source of the article. Until recently, however, though bearing a *good* price in the market, the demand has not been such as to induce a large production.

Of late, several circumstances have tended to create an increased demand.

In 1884 it was estimated that 350,000 lbs. of milk-sugar were produced in Switzerland alone; about one-half that amount in all other places, including Bavaria, Italy, Austria and Germany[2].

England and the U. S. are the chief consumers of the Swiss product[3]. The United States yearly imports 100,000 lbs. and England, an equal or larger amount[3].

Milk sugar is a constituent of the milk of all mammals; the per cent. varying in different animals, and in the same animal under different conditions[8]. It is a hard crystalline substance represented by the formula $C_{12}H_{22}O_{11}$ or $C_{12}H_{22}O_{11}+H_2O$ [2] according to the method of crystallization. In a pure state it is white, gritty when powdered, with slighly sweet taste and neutral reaction.

It is soluble in 1–2 parts of hot water, 6–7 parts of cold water; and said to be insoluble in 'ether,' 'chloroform,' and 'alcohol.' (U. S. P.) However, I found that it is soluble to considerable extent in *alcohol* at ordinary temperatures.

Though contained in the milk of all mammals it is obtained for use exclusively from the milk of the cow, never having been produced from any source but milk, by synthesis or otherwise.

Reactions in manufacturing processes:

(*a*) Solution of rennet in brine effects the coagulation of casein in milk by converting part of the sugar into lactic acid[4].

(*b*) Mineral acids like HNO_3 and H_2SO_4 with the aid of heat convert milk sugar into derivative acids[5]. (Mineral acids are sometimes used in the production of sugar of milk).

(*c*) Caustic alkalies added to whey during evaporation, blackens and spoils the product, probably by burning the sugar.

(*d*) It forms compounds with bases similar to cane sugar and dextrose[5].

(*e*) Heated to 170°C. with water it breaks up into C CO_2 and formic acid[9].

(*f*) It chars or burns exceedingly easy.

[2]The process used in manufacturing is mainly as follows: The fat and casein of the milk are removed, (generally at the same time) by rennet and acids, in production of Swiss cheese. The resulting liquid or whey is evaporated to a syrupy consistence, in large flat bottomed copper kettles,

with rather shallow basins, over wood fires built in rude furnaces. The syrupy mass is allowed to cool and crystallize, the result being the crude sugar, which is rinsed with water, drained, dryed, and sacked. This product is sold to the refineries, eight of which exist in the provinces of Berne and Lucerne, and monopolize the business. Here the crude sugar is washed with several portions of water and the washings saved and re-evaporated, and the contained sugar recrystallized. The washed product is dissolved in hot water, and allowed to crystallize and this operation repeated until a sufficiently pure article is obtained. The amount of washing needed, and the number of recrystallizations necessary, depends upon the quality of the crude sugar, and the desired quality of the finished product.

This in general is the method used abroad, by which, from the whey, about 2½%–3% of sugar is obtained: from the milk—2%–2½%, as crude sugar. This is too small a per cent. when it is considered that milk has 4%–4½%, and whey 4½%–5% of sugar, and that in purifying crude sugar, there is considerable waste.

I made several estimations, beginning with fresh milk, but as whey is the direct source of milk-sugar, rather than milk in its natural state, I paid more particular attention to the estimation of sugar in the former. I first estimated the sugar in the milk, then in the whey, afterward in the crystallized state, as follows: Ten c. c. of the milk accurately measured in a pipette was diluted to 100 c. c. with distilled water. The sugar present was estimated by means of Fehling's solution, standardized with a known solution of C. P. milk-sugar. Twenty c. c. of Fehling's solution required 26.5 c. c. of standard milk-sugar solution for reduction; indicating .006625 gms. of milk sugar to each c. c. of Fehling's solution. Now 10 c. c. Fehling's solution was treated with the solution of milk, requiring 24 c. c. for complete reduction. According to the empirical factor obtained above, this indicated 4.02%.

A gravemetric estimation of the same sample was made as follows: 1280 c. c. of fresh milk sp. gr. 1,030 was allowed to stand 24 hours in a cool place. At the expiration of that time the cream was removed as completely as possible. The milk was then raised to a point considerably short of the boiling point, and 20–25 c. c. rennet per thousand c. c. of milk added. This caused nearly the complete coagulation of the casein in a short time. However, rennet does not *completely*[8] remove casein from milk.

The whey, after removal of the casein by straining through muslin had a sp. gr. of 1,036 and contained 5% of sugar of milk, when estimated by the preceeding method.

The whole of the whey was now boiled for one-quarter of an hour, which caused the coagulation of the albumen of the milk, with which the residual casein became entangled. This precipitate was also removed by straining, and the strainer washed with several small portions of hot water. The resulting liquid was of a faintly yellowish-white color, and pleasant odor, containing the natural salts and the sugar of the milk, together with the Na Cl[9] originally contained in the rennet solution. This liquid was evaporated to about one-fifteenth of the original volume of the whey, and allowed to cool and crystalize, which process takes about two days. The resulting crude sugar is of a dark or brown color, depending upon the care used in evaporating. It has a sweetish, saline taste, and is very hard. This crude mass was dissolved in pure water, boiled, and digested with animal charcoal for a few hours, and the operation repeated *once*. This removed the last traces of coloring matter, and gave a clear and nearly water white solution. This solution was evaporated, crystallized and the sugar weighed. Owing to some experiments with alcohol, and some other waste not sufficiently guarded against, I obtained only about 3% of sugar from the whey.

Another experiment conducted in a similar manner, turned out better. The following are the figures: Milk

taken 1823 c. c. (1879.32 gm.) sp. gr. 1.0309. C. c. of whey obtained from milk 1500. (1557. gm.) sp. gr. of whey 1.038. Per cent. of sugar in whey by estimation 5.245%. Per cent. of sugar obtained 4.3837%. This per cent. is *considerably* more than that obtained in commercial manufacture. The whole process takes about fourteen days.

It has been recommended to purify sugar of milk by precipitating it with alcohol, but this is expensive and the writer finds that it has no special advantage over the process of recrystallization from hot water. After evaporating the whey to about one-third its original volume it is advisable to allow the solution to stand a short time when a large portion of the earthy salts will be deposited.

If the whey is allowed to become sour a portion of the sugar of milk will be converted into lactic acid.[4]

Nearly all of the Swiss product is the output of less than a dozen refineries.[3] Many of our large cheese and butter factories consume fifteen hundred gallons of milk per day, the whey from this quantity alone would furnish more sugar of milk every six months than the largest refinery in Switzerland puts upon the market yearly. From the preceeding it would seem that a few plants in the U. S. would be able to control our own market, and perhaps that of England.

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1. Watts' Dictionary, vol. 3, p. 1033.
2. Am. Drug., vol. 13, 1884, p. 161.
3. Falsification of Foods, Mitchel, p. 74.
4. Watts' Dictionary, (Sugar of Milk.)
5. Prescott's Organic Analysis. Remsen's Organic Chemistry.
6. Am. Jour. Ph., vol. 39, p. 335.
7. Am. Jour. Ph., vol. 21, p. 370.
8. Chem. News, vol. 49, p. 168.
9. Watts' Dictionary, (Milk.)

The Value of Licorice, Yerba Santa, and Saccharine in Disguising the Taste of Quinine.

BY HENRY FRANZ,
SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The writer made comparative trials of these three substances to ascertain which was to be preferred for disguising the bitter taste of quinine and other substances. Licorice was first tried, and the fluid extract of a good sample of the root was prepared. It was found that the fluid extract, aside from not being very efficient in disguising the bitter taste, was itself of rather unpleasant taste. The sollid extract, called "tub licorice," was then obtained. This extract is largely used by tobacconists, and is seldom found in the drug market. Great care is taken in its manufacture, and it is far superior in flavor and taste to the ordinary extract. A syrup was made after the following formula:

Ext. licorice,	2 Troy ozs.
Sugar,	10 " "
Glycerine,	2 " "

Water sufficient to make 16 fluid ounces.

Dissolve the extract in 8 ounces of water on a water bath; add the sugar and dissolve it, strain, add the glycerine and enough water to make 16 fluid ounces. This made an excellent syrup, but the limit of its disguising power was found to be 2 grains quinine sulphate to a fluid drachm of the syrup. A solution of this extract was made according to the formula given in the National Formulary, as follows: Take a small portion of the extract; dry to constant weight and note the loss of moisture. Then take of the extract a sufficient quantity, equivalent to 4 Troy ounces of dry extract; dissolve in 4 fluid ounces of water on a water bath; add 4 fluid ounces of glycerine, cool; add 2 fluid ounces of alcohol, and sufficient water to make

16 fluid ounces. This solution is an agreeable preparation, and has a disguising power of 3 grains quinine to the fluid drachm.

Yerba Santa was next experimented with. A syrup containing a half fluid ounce F. E. to the pound was made. The syrup was of fine appearance, pleasant taste, and 3 grains of quinine to the fluid drachm of syrup could be very efficiently disguised. A stronger syrup was made after the following formula:

F. E. Yerba Santa,	6 fluid drachms.
Liquor potass.,	200 minims.
Sugar,	13 Troy ounces.
Water sufficient to make	16 fluid ounces.

Add the liquor potash, fluid extract and 1½ fluid ounces of water to the sugar contained in a wide-mouthed bottle; place the bottle in boiling water until the sugar is dissolved, and strain. This syrup was of a little darker color than the first, but was a nice preparation and had a pleasant taste; 4 grains of quinine sulphate were added to a drachm of the syrup and the quinine could not be detected.

Saccharine was next tried. A solution was made of 2 parts saccharine and 1 part sodium bicarb. in a menstruum containing alcohol 1 part and water 3 parts, so that 1 grain of saccharine was represented in 20 minims of the solution. One grain of sulph. quinine was added to a fluid drachm of the solution. A dense white precipitate of the alkaloid was at once thrown down, due to the alkalinity of the solution. A clear solution was obtained by adding a small quantity of dilute sulph. acid and was then tested, it being found that the extreme sweetness of the saccharine would not overbalance the bitterness of the quinine.

An elixir of taraxacum was mixed in equal parts with syrup of yerba santa, and proved a very efficient disguiser of quinine, but the bitter taste of the dandelion was

perceptible. Nux Vomica was easily disguised by either the licorice or the yerba santa. It was found that a solution of licorice covered the bitter taste of cascara sagrada very materially, while syrup of yerba santa made a white and nauseating mixture.

The conclusions arrived at are that of these three disguising agents, licorice is to be preferred, but that the quality known as "tub licorice," used by tobacconists, should be obtained when possible, it being peculiarly pure, of very rich flavor, and sweet taste.

REMARKS:

MR. PARSONS: A gentleman stated the other day that horse mint was one of the most valuable things to use in this connection.

MR. SNOW: Did he try the use of the yerba santa sample without any aromatics.

MR. STEVENS: This was all conducted on the samples themselves without aromatics.

Economy in the Preparation of Iodoform.

BY T. W. BOWEN,
SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The author compares the merits of the old process (Filhol's) of manufacture from alcohol and iodine in alkaline solution, decomposing the filtrate with chlorine and repeating, with those of the recently proposed method of Sulliot and Raynaud (ERA, April, 1889, p. 121), consisting of the decomposition of potassium iodide by acetone and sodium hypochlorite in solution made alkaline by sodium hydrate.

The claimed superiority for this latter process is in the theory that all the iodide is converted into free iodine, and is then acted upon by the acetone to form iodoform.

Iodates of sodium or potassium are formed if the hypochlorite solution be not very dilute.

To produce 1 lb. of iodoform by this method the following quantities, with corresponding prices, are necessary:

MATERIAL.	QUANTITY.	COST.
Potass. iodide.	2 lbs. 2.04 oz.	$6.505.
Acetone,	3 ozs. 121.2 grs.	.26
Sod. hydroxide,	1 oz. 300.6 grs.	.065
Sod. hypochlorite,	19.5 gals. (U. S. P., 1870),	.976
		$7.81

By Filhol's process, a parallel table is:

MATERIAL.	QUANTITY.	COST.
Iodine,	2 lbs. 2.9 ozs.	$7.65
Sod. carb.	9 lbs. 3.7 ozs.	.17
Alcohol,	4 lbs. 8.5 ozs.	1.23
Hydrochloric acid,	" " "	.22
Black oxide manganese,	" " "	.22
		$9.49

All weights are Troy.

It is thus seen that the new process costs 21.5 per cent. less than the old, no account of labor being considered. The new process is by far the easier and quicker, and the writer believes that further trials would show still better results than he here gives.

Ointment of Nitrate of Mercury.

BY H. VAN ETTA,
SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The U. S. P. (1880) directs that lard oil be used as a base, but owing to the different grades of lard oil on the market, it is almost impossble to get a smooth, firm preparation by the employment of this base. Commercial lard oil is frequently adulterated with some of the vegetable

oils, principally cotton seed oil. The U. S. P., 1870, directs lard as a base. Lard makes a preparation smooth, and of even consistency, but very hard. The author experimented with the following bases: Lard, lard oil, sperm oil, neat's foot oil, and cotton seed oil—tried separately and in varying combinations, tabulated results as below:

With	*Gives Ointment.*
Lard,	Light yellow, very hard.
" and sperm oil (68 and 8),	" " firm.
" " " " (60–16),	" " soft.
" and neat's-foot oil (68–8),	" " rather hard.
" " " " " (60–16),	" " hard.
Sperm oil,	Almost white, very soft, did not harden.
Neat's-foot oil,	Dark yellow, granular.
Lard oil (1st sample),	Light amber, soft.
" " (2d sample),	Dark " "
" " (3d sample),	Amber, firm.

The lard used in these investigations was prepared as follows:

Pure leaf lard was obtained, the outer membrane and bloody portions removed, cut into fine pieces and passed through an Enterprise fruit press to destroy the cellular structure. It was then rendered, by heating at a temperature not above 50°C. (122°F.,) and strained through muslin. The product was firm and very white. To obtain lard of a reliable quality the pharmacist should render it himself, as most that is found in market (especially that labelled "Refined Lard," " Choice Family Refined Lard," and " Prime Family Refined Lard,") is a mixture of lard, cotton seed oil, and beef stearin (*Analyst, XIII., pp. 69 and 165*), and is unfit for pharmaceutical uses.

The author submits the following formula for an elegant preparation, of light color and firm consistency:

Mercury,	7 parts.
Nitric acid,	17 "
Sperm oil,	8 "
Lard,	68 "

Mix the lard and oil and proceed according to the U. S. P. A softer ointment results from increase of the quantity of the oil, a harder from increasing amount of the lard.

REMARKS.

MR. STEVENS: Very many have supposed that the lard ordinarily used is pure lard, but investigation made at different times, both in the United States and in England, proves, without doubt, that it is a mixture of lard and oils. Several parties were arrested in England for selling adulterated lard and their defense was that the name "Refined Lard" did not refer to pure lard, and therefore was not an imposition; the name being known as applied to a mixture of lard and oils. We find in the report made in the United States of examinations of lard manufactured in Chicago, that they used a certain amount of cotton seed oil. Of course, if lard itself is adulterated in this manner the lard oil produced by these parties is liable to be. You can hardly find two samples of lard oil alike. So it is useless to take such an article as a base for pharmacopœial preparations.

MR. DUPONT: It would like to ask if the sperm oil of commerce is considered standard?

PROF. STEVENS: It is more uniform than most oils. I do not know that it is adulterated to any extent. It is certainly quite uniform in appearance, and preparations made from it are uniform. In the preparation from neat's-foot oil, it was granulated, did not harden enough to be of the proper consistence for use. I would like to say a word with regard to the rendering of ordinary lard. It is a very easy matter, if you will select, in the winter season, good lard, and see that it is free from moisture. We know that lard rendered by farmers contains more or less moisture, which makes it objectionable, but when rendered in this manner you can obtain an article which is perfectly white, firmer than "refined lard," and will be found to keep

much better. I have known lard prepard in this way to be kept two years, when protected from the air.

Solution Chloride of Iron.

TO FIND A METHOD FOR ITS MANUFACTURE WITH A UNIFORM SPECIFIC GRAVITY OF 1.40.

BY HARRY A. ALLSHOUSE, PH. C.,
SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The U. S. P. requires that Solution Chloride of Iron should have a sp. gr. of 1.40. Ten grams of the solution, when precipitated with ammonia, washed, dried and ignited, should yield a residue of 1.86 Gm.

The writer has endeavored to find a method by which the solution can be made to meet these requirements.

Ten solutions were made according to the Pharmacopœia with hydrochloric acid of sp. gr. 1.16.

The finished solutions had a specific gravity varying from 1.35 to 1.37. Numbers 2, 5, and 9 were estimated gravimetrically, employing ten grams of the solution for each estimation. No. 2 weighed 1.78 Gm., No. 5, 1.76 Gm., No. 9, 1.769 Gm.

Ten solutions were then made according to the Pharmacopœia but were not removed from the flasks, except to filter out the iron wire.

These solutions gave a sp. gr. varying from 1.369 to 1.382. Numbers 4, 7, and 10 gave a residue of 1.778, 1.84 and 1.801 Gm. respectively.

Six solutions were then made according to Pharmaco pœial rules excepting with the slight variation of applying heat to each solution until effervescence ceased, instead of allowing it to stand until that result was obtained.

These solutions gave a sp. gr. varying from 1.34 to 1.36. Number 4 gave a residue of 1.741 Gm.

Ten of the junior class then made solutions according to the U. S. P. with resulting specific gravities of from 1.312 to 1.37. Another ten made solutions according to the U. S. P. except gently heating until effervescence ceased with resulting specific gravities of from 1.221 to 1.342.

I then made six solutions, increasing the hydrochloric acid to 87.5 parts, with the following results, sp. gr. varying from 1.378 to 1.39,

I then made ten solutions, increasing the hydrochloric acid to 89 parts and the iron to 18 parts, with the following results: Nine of the solutions had a sp. gr. of 1.40 and one had a sp. gr. of 1.3996. Numbers 1, 3, and 5 were estimated gravimetrically, yielding a residue of 1.86, 1.858 and 1.86 respectively. I then requested 20 of the junior class to make their solutions by the modified formula. These solutions had a sp. gr. varying from 1.39 to 1.40 (12 of the number had a sp. gr. of 1.40).

I would therefore recommend that the iron be increased from 15 to 18 parts, and the hydrochloric acid from 86 to 89 parts. In the directions the followining changes should be made, (page 196, 2d line from the bottom) 54 to 56 parts, (page 197, 4th line from the top) 27 to 28 parts.

As an excess of iron exists, the strength of the solution must depend upon the strength of hydrochloric acid used, it is therefore evident that the acid must have a uniform specific gravity of 1.16.

Does the Percentage of Carbon Di-Oxide, in Commerical Ammonium Carbonate, Agree with the Chemical Formula, Given in the United States Pharmacopœia?

BY CHAS. C. ABBEY,

SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The molecular formula of the Pharmacopœia, indicates a percentage of Co_2 of 56.05. Deducing it from the Pharmacopœial formula, $NH_4HCO_3(NH_4)NH_2Co_2$, (which expressed by an equation, would be, as follows, NH_4HCo_3-$NH_4Co_2NH_2=(NH_3)_3(Co_2)_2H_2O$), there is a theoretical percentage of 56.05. There is another formula used to express the chemical formula of Commercial Ammonium Carbonate, namely, $2(NH_4HCo_3)$, $NH_4CO_2NH_2$,* which would have a percentage of 55.93, of Carbon Di-Oxide. An equation representing this formula would be, $2(NH_4HCo_3)NH_4Co_2NH_2=(NH_3)_4(Co_2)_3(H_2O)_2$.

Edward Divers, M. D., 1870; Jour. Chem. Soc., N. S. 8, 233, made a number of estimations of different samples of Commercial Carbonate of Ammonia, and found that the commercial article was very uniform in composition with one special exception, and that was, that the composition was no longer expressed by the formula $2(NH_4$-$HCo_3)$, $NH_4Co_2NH_2$, but by a simple formula $(Co_2)_2$-$H_2O(NH_3)_2$. The last named formula, agrees with the formula accepted by the Pharmacopœia of the United States. The same author, states, "that when the salt contains 2.5% of water, it will reduce the percentage of Carbon Di-Oxide to 54.65."

In my work upon Commercial Carbonate of Ammo-

* John Attfield, 1873; Chemistry, 5th Edit. 1, 78.

nia I have employed different samples, procured at different stores, with varying results.

The method followed is described in Cheever, 1888; Select Methods in Quantitative Analysis, part 2, 78, which is briefly, by decomposing the salt with HCl, drying the gas generated with H_2SO_4 or $CaCl_2$, care being taken that the $CaCl_2$ is thoroughly carbonated before beginning work. The gas, after being dried, is collected in a Geisler Potash bulb, which contains a solution of potassium hydrate, strong enough to absorb the Carbon Di-Oxide. The following are the results obtained: Six estimations made upon one sample, yielded from 56% to 56.9%. Seven estimations made upon another sample, from a different store, yielded from 54.001% to 54.08%. Several estimations were made upon other samples with results varying from 53.14 to 55.01%. It will be observed that different samples vary considerably, probably due to the amount of water they contain. In the first sample given, the salt met the requirements, all of the remaining samples failed.

The Separation and Estimation of Some of the Constituents of Ginger.

BURT L. JOHNSON,
SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The ginger used for this purpose was of the Jamaica variety, it was decorticated.

The powdered ginger was first treated for the estimation of moisture and volatile oil. This estimation was accomplished by the use of a regulated drying oven. The temperature was kept at not over 100°C. till a constant weight was obtained. There was a loss of 17% for moisture. The temperature was then increased and held between 155 and 160°C. until a constant weight was obtained. The loss by weight here obtained was .4% and equals the volatile oil.

The powder was then extracted with ether, and the oleo-resin obtained. This substance was of a semi-fluid consistence and of a dark red color. It has the odor of ginger and a biting taste. The ether was evaporated spontaneously by passing a stream of dry air over it. At this point the globules of volatile oil could be seen, and was of a straw or lemon color. The powder was found by estimation to contain 6.75% of oleo-resin.

The oleo-resin was then distilled for the volatile oil it contained, and at 155°C. the first oil came over, of a lemon-yellow color. It had not the characteristic odor of ginger, but an odor peculiar to itself. When the temperature was increased to 160°C. the oil obtained was much darker in color, bordering on the reddish-brown. Both of these products evaporated without leaving a residue which would lead one to suspect that there were two distinct volatile oils in ginger. This fact is hinted at by two authorities, and by the reactions appear very probable.

The residue from the oleo-resin was next treated with petroleum ether (Rhingolene), which, on being allowed to stand threw down an inert crystalline matter. I think this is the substance alluded to by Mr. Thresh, and termed by him *fatty matter*. It was found to constitute 1.3% of powdered ginger.

After the removal of the "fatty matter" the residue consisted of the resins proper and the active principle. The gingerole and also a small quantity of resin has been found to be soluble in (CS_2) carbon di-sulph. After treating with CS_2 the pure resin was separated, and constituted 2.6% of the powdered ginger. This resin is nearly solid and of a red-brown color.

The CS_2 was evaporated from the remaining portion, which was then treated with alcohol. This dissolved the gingerole with a small amount of resins. After allowing it to stand for some time the supernatent alcoholic solution was decanted upon filter paper, and the filtrate treated

with basic lead acetate. On standing for some time the globules of yellowish-colored gingerole, mixed with resin separated. The supernatent liquid was decanted and the globules washed several times with acetic acid. The gingerole thus obtained had a fiery, biting taste, and caused great smarting when applied to surface of the skin.

The per cent. of gingerole can only be estimated approximately, as it cannot be thoroughly freed from resin, and if obtained in the pure state quickly oxidizes to other compounds.

SUMMARY OF RESULTS.

Volatile oil,	.4 %
Moisture,	17. %
Fatty matter,	1.3 %
Oleo-Resin,	.6¾ %
Resin (Aprox.),	2.6 %
Gingerole,	Small.

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J. C. Thresh, [3] 20, 372. Arch. Pharm.

Constituents of Ginger—J. C. Thresh, 1882, Jour. Chem. Ind.

Constituents of Ginger—J. C. Thresh, 1881, Jour. Chem. Ind., p. 515.

Constituents of Zingiber Officinale—J. C. Thresh, 1882, Yr. Bk. Pharm., p. 172.

CONSTITUTION AND BY-LAWS.

ADOPTED AT PETOSKEY, MICHIGAN, JULY 13TH, 1887.

PREAMBLE.

WHEREAS, Organization, concert of action, and comparison of ideas, are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore,

Resolved, That we, druggists of the State of Michigan, whose names are hereunto attached, in compliance with an act entitled an act to organize the reputable pharmacists of the State of Michigan into an Association to be known as the Michigan Pharmaceutical Association approved April, 1887, do hereby organize ourselves into such Association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The object of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard, and, ultimately, to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.—MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia med-

ica, chemistry, and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.—Officers.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected by ballot at the third sitting of the regular annual meeting of the Association, and to serve until their successors are elected.

ARTICLE V.—Duties of Officers.

Section 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, until the close of such meeting; call special meetings at the written request of twenty-five members; fill all vacancies that may occur in the offices of the Association between the annual meetings; shall present at each meeting a report of the Association, and perform such other duties as pertain to the office

Section 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all monies for dues, and from all other sources, giving receipts for the various amounts, keep a

correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee. He shall file a copy of the proceedings of each annual meeting in the office of the State Board of Health, and of the Secretary of State, and shall keep at least three copies in his own office.

SECTION 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

SECTION 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association committed to their care.

SECTION 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.—MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.—BY-LAWS.

This Association may establish for its future government and regulation, such By-Laws, not in conflict with this Constitution, as may be deemed proper and desirable.

ARTICLE VIII.—AMENDMENTS.

Every proposition to alter or amend this Constitution

shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three fourths of the members present it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.—Quorum.

Twelve members shall constitute a quorum.

ARTICLE II.—Membership.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented to the Association in writing signed by two members in good standing, and shall be referred to the Executive Committee, and if favorably reported by that committee, the candidate may be balloted for at once. A vote of two-thirds of the members present shall be required for an election.

ARTICLE III.—Fees.

The initiation fee of this Association shall be one dollar, which fee shall be paid to the Secretary.

ARTICLE IV.—Dues.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.—Certificate of Membership.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of

membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.—COMMITTEES.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be an ex-officio member,) each to consist of three members, viz: Committee on Trade Interests; Committee on Pharmacy and Queries; Committee on Legislation; Committee on Adulterations.

SECTION 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.

SECTION 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable, to be reported upon at the next annual meeting.

SECTION 4. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.—SUSPENSIONS—AMENDMENTS.

SECTION 1. These By-Laws shall not be suspended without the consent of two-thirds of the members present.

SECTION 2. Any amendment to these By-Laws must be made in writing and read before the Association at one

sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two thirds of the members present, it shall become a part of these By-Laws.

ARTICLE VIII.—Delegates.

Five delegates and five alternates shall be annually elected to attend the meeting of the American Pharmaceutical Association.

ARTICLE IX.—Proceedings.

The proceedings of the Association, the roll of officers, committees and members, shall be published annually under the supervision of an editor, who shall be elected annually, and who shall be paid from the funds of the Association, and a copy of the proceedings shall be sent to each member of the Association less than two years in arrears.

ARTICLE X.—Expulsion of Members.

Any member or officer accused of violating the Constitution or By-Laws, or other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting. In every case definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the charges, and notify him in writing, at least two weeks in advance, of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense.

ARTICLE XI.—Exhibits.

The Association invites manufacturers and others to exhibit at the annual meetings, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.—Rules of Order.—Order of Business.

Section 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

Section 2. The order of business shall be such as the Executive Commtttee shall prescribe.

Roll of Members.

		ELECTED.
Adams, H. M.	Port Huron	'88
Adams, C. H.	Otsego	'84
Adamson, J. W.	Holly	'85
Akey, J. V.	Colon	'85
Albright, John H.	Colon	'89
Aldworth, F. G.	Grand Rapids	'84
Allen, A. W.	Detroit, 410 G'd River Ave.	'83
Allen, Earl	Stanton	'87
Allen, E. F.	Boyne City	'85
Alsdorf, F. M.	Lansing	'83
Amberg, Isaac	Battle Creek	'86
Anderson, Ellery	Midland	'84
Anderson, Maxon	Midland	'84
Anderson, Edwin S.	Detroit, 159 Jefferson Ave.	'88
Anderson, C. N.	Detroit, 24 W. Adams Ave.	'88
Andrus, C. S.	Detroit, 1151 Jefferson Ave.	'85
Andrus, E. J.	Utica	'86
Armstrong, R. S.	Chelsea	'88
Arthur, Hiram	Dowagiac	'87
Atchinson, F. E.	Gladwin	'88
Atwater, C. H.	Lapeer	'84
Baar, Henry	Grand Haven	'85
Babbington, John	Corunna	'84
Bachman, M. H.	Stanton	'83
Bahel, C. W.	Otsego Lake	'84
Baier, C. G.	Detroit, 326 Gratiot Ave.	'83
Bailey, Morrison	Plainwell	'86
Bailey, M. G.	Mackinaw Isl.	'88
Baker, Dennis	Grand Rapids, 89 Monroe Ave.	'85
Baker, H. G.	Detroit, (T. H. H. & Sons)	'88
Baker, W. H.	Whitehall	'85
Baldwin, E. L.	Ludington	'84
Bangs, W. Z.	Holland	'85

		ELECTED.
Banister, Geo. E.	Utica	'89
Barber, M. A.	Petoskey	'87
Barker, W. J.	Ashley	'86
Barie, H. L.	Detroit	'87
Barry, Frank	Rodney, Mecosta Co.	'88
Barrows, J. F.	Lawrence	'85
Bartram, E. W.	Paw Paw	'83
Bassett, A	Detroit, 95 Woodward Ave.	'84
Bassett, E. C.	South Lyon	'84
Bassett, J. A.	Detroit, (J. E. Davis & Co.)	'85
Bauer, A. C.	Grand Rapids	'84
Baxter, T. A.	Grand Rapids	'84
[illegible]	Bay City	'84
Beachum, C. B.	Romeo	'84
Beaman, G. W.	East Jordan	'86
Beck, W. H.	Detroit, 22 Bagley Ave.	'87
Beckwith, R. G.	Bradley	'88
Beebe, Hosmer	Eaton Rapids	'83
Beeden, Bert N.	Detroit, 185 Jefferson Ave.	'89
Bell, John	Lexington	'88
Belsher, W. E.	East Saginaw	'84
Bennett, J. R.	Menominee	'84
Bennett, L. T. E.	Port Huron	'85
Bennett, C. W.	Quincy	'88
Bertram, Julius	Alpena	'84
Bertram, J. P.	Westphalia	'83
Bigelow, W. H.	Owosso	'84
Bigg, A. H.	Detroit, 255 St. Aubin Ave.	'84
Bird, C. E.	Saugatuck	'84
Bird, Chas. A.	Detroit, 324 6th St.	'88
Birge, W. E.	Kalamazoo	'84
Black, Josiah	Detroit, 1115 Russell St.	'88
Blatchley, C. H.	Manistee	'88
Black, J. R.	Detroit, 51 Park Place	'88
Blackmer, H. A.	Charlotte	'84
Blair, C. A.	Morenci	'85
Blakeslee, L. G.	Detroit, 177 Griswold St.	'85
Boehnlein, George	Detroit, (W., S. & B.)	'86
Bolio, E. William	Detroit, 97 Div. Ave.	'88
Booth, J. B.	Detroit, (P., D. & Co.)	'88
Bostick, J. C.	Manton	'87

		ELECTED.
Botsford, E. S.	Dorr	'86
Bower, J. E.	Crystal Falls	'87
Bower, Manley	Clarkston	'83
Braddock, O. L.	South Bay City	'85
Brackett, F. E.	Cheboygan	'87
Breitenbach, A. P.	Detroit, 99 Elizabeth St.	'89
Bricker, C. E.	Port Huron	'88
Bridgeman, M. L.	Menominee	'84
Briggs, J. W.	Schoolcraft	'83
Bristol, F. E.	Lapeer	'84
Bristol, U. D.	Lapeer	'84
Bross, C. M.	Jerome	'89
Brown, D. D.	Kalamazoo	'85
Brown, H. J.	Ann Arbor	'83
Brown, J. J.	Okemos	'83
Brown, W. J.	Detroit	'88
Browning, G. B.	Decatur	'85
Brundage, Fred	Muskegon	'86
Bruske, R.	East Saginaw	'85
Buchanan, B. F.	Harrisville	'83
Buchanan, B. S.	Detroit, 133 Woodward Ave.	'88
Bugbee, C. A.	Cheboygan	'85
Bullard, E. A.	Vassar	'83
Bullock, J. W.	New Lothrop	'88
Burdick, H. H.	Bay City	'84
Burroughs, C. S.	Clinton	'84
Burwell, R. G.	Fort Gratiot	'84
Cady, G. F.	Hart	'83
Cahalan, J. C.	Wyandotte	'84
Caldwell, G. G.	Centreville	'85
Caldwell. J. W.	Detroit, 242 G'd River Ave.	'84
Calkins, S. B.	Petoskey	'85
Calkins, E. E.	Ann Arbor	'88
Cameron, Alexander	Kalamazoo	'85
Campbell, Rob't A.	Port Huron	'88
Campbell, Geo.	Grand Ledge	'88
Campbell, J. E.	Detroit, 477 G'd River Ave.	'88
Carney, M. S.	Decatur	'85
Carpenter, A. D.	Cadillac	'85
Carrier, Hubert	Bay City	'84

		ELECTED.
Case, George N.	Cheboygan	'87
Caulkins, Frank D.	Clarkston	'88
Chamberlain, G. T.	Hartford	'83
Chamberlain, M.	Horton	'84
Champney, W. R.	Detroit, 27 Lafayette Ave.	'83
Chandler, C. A.	Cambria Mills	'84
Chapple, L. D.	Wayland	'86
Chester, E. F.	Cedar Springs	'88
Church, H. M.	Holly	'84
Church, Wm. D.	Detroit, (P., D. & Co.)	'89
Clark, A. G.	White Cloud	'83
Clark, J. K.	Blissfield	'84
Clark, H. C.	Detroit	'88
Clark, Arthur B.	Gobleville	'89
Claxton, W. C.	Calgany Alberta N. W. T., Can.	'85
Cleland, Henry	Detroit, 79 Montcalm St. W.	'85
Cleveland, H. W.	Nunica	'84
Close, Orrin E.	Spring Lake	'87
Coe, T. D.	Romeo	'84
~~Coffin, C. L.~~	~~Detroit~~	'85
Collins, Jno. B.	Frankfort	'88
Collins, A. B.	Charlotte	'89
Coleman, G. E.	Elk Rapids	'85
Coleman, H. G.	Kalamazoo	'84
Colwell, C. B.	Jackson	'86
Connine, Dewitt	Wexford	'85
Connell, F. G. L.	Detroit, 55 Montcalm St.	'84
Conrad, J. F.	Otsego	'86
Conway, V. R.	Sault Ste. Marie	'85
Cook, C. E.	Bay City, 912 Van Buren St.	'84
Cooper, D. M.	Detroit, 371 Woodward Ave.	'84
Cooper, I. S.	Cheboygan	'85
Cornell, E. A.	Thedford, Ont.	'85
Cosford, J. W.	Mancelona	'87
Couturier, Noel	Provemont	'85
Crane, Geo. W.	Cheboygan	'86
Crawford, J. B.	Ithaca	'85
Crawford, Walter	Milford	'88
Crawford, Cornelius	Grand Rapids	'88
Crispe, John	Plainwell	'86
Croman, Jos. M.	Detroit, 291 Woodward Ave.	'89

		ELECTED.
Cross, F. E.	Grand Rapids, 453 Div. St.	'85
Crouter, G. W.	Charlevoix	'83
Crowley, J. J.	Detroit, 421 Michigan Ave.	'84
Culver, R. W.	South Haven	'86
Cummer, R. J.	Cadillac	'84
Curran, E. S.	St. Joseph	'83
Currie, A. A.	St. Clair	'85
Curtis, C. A.	Petoskey	'85
Curtis, J. B. F.	New Lothrop	'88
Curtis, F. E.	Napoleon	'85
Cushman, H. D.	Three Rivers	'84
Cutler, W. R.	Ionia	'83
Damon, J. A.	Millington	'84
Darling, G. S.	Tawas City	'88
Davis, T. W.	Detroit, 308 Woodward Ave.	'88
Davis, F. C.	Vassar	'88
Davis, G. S.	Detroit	'88
Davie, R. P.	Flushing	'86
Davis, James E.	Detroit, 29 to 37 Larned, W.	'84
Dayton, A. J.	Grand Rapids	'87
Dean, H. M.	Niles	'87
DeBoe, John	Grand Rapids	'84
Deitz, G. A.	Cadillac	'83
Demorest, C. S.	Detroit, 153 Gr. River Ave.	'88
Dennis, G. C.	Rochester	'88
De Puy, C. E.	Stockbridge	'88
Dewey, C. C.	Napoleon	'85
Dewitt, P. A.	Spring Lake	'88
Dickinson, O. B.	Grand Rapids	'84
Dillon, James E.	East Tawas	'87
Dimick, S. H.	Ypsilanti	'84
Dodd, I. LeRoy H.	Buchanan	'83
Dodds, J. J.	Detroit, 51 and 53 Shelby St.	'83
Dodge, E. L.	Montague	'85
Dorrance, A. A.	Coldwater	'83
Dorr, F. W.	Manchester	'88
Dunbar, R. H.	Parma	'85
Dunham, E. W.	Grand Rapids	'86
Dunlap, Thomas	South Lyon	'84
Dunlop, J. W.	Clare	'83
Dupont, Wm.	Detroit, 182 Michigan Ave.	'83

		ELECTED.
Eaton, H. H.	Boyne Falls	'87
Eberbach, O.	Ann Arbor	'83
Eberbach, Wm. F.	Ann Arbor	'89
Eckerman, A.	Muskegon	'84
Eldred, B. C.	Chesaning	'85
Elliot, R. H.	Pontiac	'85
Empey, M. C.	South Bay City	'84
Emster, F. H. J. van	Bay City	'85
Erwin, M. J.	Harbor Springs	'87
Ester, Chas. K.	Grand Haven	'88
Everhart, James	Wacousta	'85
Fairchild, H. B.	Grand Rapids	'86
Fales, F. R.	Vassar	'84
Farrand, J. S.	Detroit	'84
Farrand, J. S., Jr.	Detroit	'88
Fasquelle, L. J.	Petoskey	'85
Fatin, C. A.	Almont	'85
Fay, O. J.	Carlton	'88
Fellows, C. A.	————	'84
Fenton, A. W.	Bailey	'86
Fenton, George L.	Kingsley	'85
Fildew, A. S.	St. Johns	'84
Fincher, F. W.	Pentwater	'83
Fisher, James	Marlette	'87
Fisk, C. A. E.	Mancelona	'85
Foote, C. E.	Jackson	'86
Foot, Wm. H.	East Saginaw	'84
Fordham, M.	Elmira	'85
Fordham, W. W.	Elmira	'84
Foster, W.	East Tawas	'84
Fournier, Lucien	Bay City	'84
Fox, J. R.	Cedar Springs	'86
Frank, H. A.	Detroit, 291 Congress St.	'83
Francis, A. B.	Jackson	'87
French, C. S.	Hillsdale	'88
Frenzel, G. S.	Mayville	'89
Fritz, T. H.	Cass City	'85
Frizelle, C. L.	Detroit, 26 Michigan Ave.	'84
Fulton, Robert	Detroit, 375 Baker St.	'84

		ELECTED.
Gardner, A. R.	Fowlerville	'84
Garrigues, Edwin B.	Philadelphia, Pa., 410 Race St.	'89
Gates, T. O.	East Tawas	'84
Geary, S. M.	Maple Hill	'86
Gerow, J. E.	Ovid	'83
Gibb, John A.	Kalamazoo	'87
Gill, W. J.	Beacon	'84
Gladding, B. O.	Constantine	'83
Gladwin, H. L.	Merrill	'88
Glazier, F. P.	Chelsea	'85
Gleason, E. G.	Richmond	'84
Glover, J. H.	Detroit, 120 W. Congress	'88
Goldsmith, G. S.	Manistee	'85
Goodrich, L. C.	Kalkaska	'83
Goodrich, L. A.	Hillsdale	'84
Goodsill, A. A.	Jasper	'84
Goodyear, W. H.	Hastings	'85
Goodwin, S.	Detroit, 462 Jos. Campau Ave.	'88
Gould, Otis	Henderson	'88
Gover, G. H.	Leaton	'84
Grandy, Francis	Fairfield	'85
Grandy, M. A.	Sault Ste. Marie	'87
Grand-Girard, H. E.	Big Rapids	'88
Gregory, A. W. C.	Albion	'84
Greenthal, Julius	Detroit, 986 Michigan Ave.	'88
Green, Chas. H.	Detroit, 711 Woodward Ave.	'89
Griffith, W. F.	Howell	'83
Griggs, S. A.	Detroit, 81 Woodward Ave.	'88
Grosse, W. F.	Sault Ste. Marie	'85
Grunow, O. H.	Detroit, 182 Gratiot Ave.	'84
Gundrum, George	Ionia	'83
Haan, G. T.	Grand Rapids	'84
Hackett, P. E.	Wolverine	'86
Haeussler, G. J.	Manchester	'85
Hagerman, F.	Birmingham	'86
Haight, A. L.	Woodland	'86
Hale, H. G.	Nashville	'83
Hall, W. A.	Greenvillle	'84
Hall, Geo. C.	Detroit, 767 Larned St., E.	'88
Hallady, O. A.	Hoytsville	'86

		ELECTED.
Haller, J. P.	Sault Ste. Marie	'85
Hallock, D. S.	Detroit, 764 Fort St., West	'84
Hamilton, E. A.	White Pigeon	'86
Hamilton, H. G.	East Saginaw	'84
Hamlen, R. J.	Detroit, 813 Gratiot Ave.	'85
Hanlon, Amos	Elk Rapids	'84
Happy, Charles	Maybee	'85
Harmon, Geo. P.	Mackinaw City	'88
Harper, J. C.	Milan	'84
Harris, J. M.	Ironton	'87
Harrison, B. D.	Barron, Wis.	'85
Harrison, D. A.	Paw Paw	'84
Harrison, H. E.	Richmond	'84
Harshaw, W. D.	Pontiac	'85
Harvey, S. K.	Detroit, 232 4th St.	'84
Harvey, T.	Farmers	'84
Harwood, G. M.	Petoskey	'84
Harwood, Henry	Ishpeming	'85
Hastings, R. A.	Sparta	'84
Hawkins, Henry	Detroit, 518 Hastings St.	'83
Hawkins, A. H.	Clayton	'88
Haynes, D. O.	Detroit, 835 Jefferson Ave.	'86
Hazeltine, A. F.	Grand Rapids	'86
Heath, Fred	Muskegon	'84
Heimbach, S. J.	Constantine	'84
~~Henderschott, Florence~~	~~Manistee~~	'88
Hessler, Will	Grand Rapids, 17 W. Bridge St.	'84
Hess, F. P.	Detroit, 453 Grand River Ave.	'88
Hewett, J. S.	Milford	'84
Hewett, L. E.	Lansing	'83
Heysett, William	Ludington	'85
Hibbard, Frank	East Saginaw	'84
Hicks, W. H.	Morley	'83
Higgins, D. W.	Scottville	'84
Hinchman, Theo. H.	Detroit, 76 Jefferson Ave.	'88
Hinchman, J. M.	Detroit, 76 Jefferson Ave.	'88
Hinchman, C. C.	Detroit, (T. H. H. & Sons)	'85
Hinds, E. J.	Midland	'86
Hisner, H. C.	Detroit, cor. Woodbridge and 3d.	'88
Hodges, F. A.	Parma	'88
Hogeboom, J. G.	Saginaw	'84

		ELECTED.
Hogguer, F. F. W.	Detroit	'84
Hollister, C. E.	Detroit, 593 Michigan Ave.	'88
Holt, A. E.	Detroit	'85
Hopkins, I. F.	Muskegon	'84
Hopkins, F. S.	Benton Harbor	'88
Horner, D. A.	Caro	'84
Hotchkiss, F.	Hastings	'84
Howard, Charles	Alpena	'85
Howard, W. S.	St. Joseph	'84
Hower, Nelson	Mendon	'85
Houp, Frank	Detroit, 328 Michigan Ave.	'84
Hudnutt, F. O.	Hanover	'88
Hueber, C. F.	Port Huron	'88
Hueston, G. C.	Northville	'85
Hull, C. W.	Bay City	'87
Humburg, Fred'k	Detroit, 934 Gratiot Ave.	'88
Hunt, A. O.	St. Johns	'85
Hunt, Dewitt H.	St. Johns	'88
Hurd, A. E.	Davison Station	'84
Hurd, C. W.	Davison Station	'85
Hurd, J. E.	Detroit, 208 Woodward Ave.	'84
Hutchings, Wm.	Leslie	'84
Hutton, R. J.	Detroit, 425 Antoine St.	'85
Hutty, F. A.	Grand Haven	'86
Huyck, E. E.	Clio	'88
Hyde, A. O.	Marshall	'83
Hyde, H. J.	Marshall	'84
Hynes, Quincy	Hastings	'85
Inglis, Frank	Detroit, 177 Griswold St.	'83
Ingram, E. J.	Iron Mountain	'83
Jackman, W. F.	Detroit, 287 Michigan Ave.	'88
Jamison, T. A.	South Boardman	'86
Jebb, Edward R.	Climax	'89
Jesson, Jacob	Muskegon	'83
Johnson, J. G.	Traverse City	'84
Johnson, Wm. C.	Detroit, 120 W. Congress St.	'88
Johnston, Wm., Jr.	Detroit, 121 Jefferson Ave.	'88
Johnson, O. C.	Ann Arbor	'84
Johnston, A. J.	Detroit, 271 Gratiot Ave.	'85

		ELECTED.
Johnston, W. S.	Detroit, 271 Gratiot Ave.	'84
Judson, F. E.	Brighton	'83
Junker, Henry	Colon	'88
Jones, M. A.	Big Rapids	'88
Kay, G. A.	Detroit, 81 Woodward Ave.	'85
Keeler, W. H.	Saginaw	'83
Kellogg, C. E.	Grand Rapids	'87
Kelly, F. H.	Au Sauble	'84
Kelly, A. F.	Cedar Lake	'86
Kelsey, F. E.	Ionia	'86
Kemink, Theo.	Grand Rapids, 81 W. Leonard St.	'84
Kennedy, T. B.	Commerce	'86
Kennedy, E. J.	Detroit, 709 Woodward Ave.	'84
Kenyon, W. W.	Howell	'84
Kephart, H.	Berrien Springs	'83
Kephart, W.	Berrien Springs	'84
Kerr, Wm.	Detroit, (J. E. D. & Co.)	'88
Kestell, J. R.	Detroit, 695 Beaubien St.	'87
Kidd, A. J.	Benton Harbor	'85
Kimball, J. L.	Crystal Falls	'84
Kinmont, B. F.	Tekonsha	'84
Kinsley, John	Manistee	'89
Kirkwood, C. H.	Ishpeming	'84
Kirkwood, P. B.	Negaunee	'85
Kirtland, J. W.	Lakeview	'85
Klingman, Theophil	Dexter	'85
Knill, Jr., H. C.	Port Huron	'88
Koon, C. S.	Muskegon	'85
Lane, I. D.	Sand Beach	'84
La Rue, C. M.	West Bay City	'85
Lambert, B. L.	Detroit, 185 Jefferson Ave.	'84
Lamoreux, John	Lakeview	'84
Lamoreux, Sarah A.	Lakeview	'84
Latimer, F. N.	Ludington	'83
Laubengayer, T. A.	Owosso	'84
Law, W. J., Dr.	Leroy	'89
Leasia, J. N.	Williamston	'85
Lee, John, M. D.	Dexter	'83
Leggett, I. J.	Paris	'87

		ELECTED.
Leland, N. P.	Gaines	'86
Lentz, Theodore	Detroit, Campbell Ave.	'85
Lenhard, C. A.	Detroit, 446 Gratiot Ave.	'88
Leuschner, Richard	Detroit, 148 Randolph St.	'84
Lever, Henry	Newaygo	'84
L'Hommedieu, F. C.	Detroit, 95 Woodward Ave.	'88
Litchfield, E. C.	Flint	'85
Little, A. F.	Aarwood	'85
Locher, H. E.	Grand Rapids	'85
Long, G. L.	Detroit, 115 Michigan Ave.	'85
Longwell, H. D.	Paw Paw	'85
Longsbury, J. H.	Reed City	'86
Longsbury, P. M.	Reed City	'85
Lowman, Oscar, Dr.	Detroit, 185 Jefferson Ave.	'89
Luce, Jr., W. O.	Caro	'85
Lunn, G. D.	Edmore	'85
Lusk, George L.	Owosso	'86
Lyman, A. H.	Manistee	'83
Lyons, A. B.	Honolula, S. I.	'84
Mason, J. F.	Warren	'88
Matthews, J. J.	East Tawas	'88
Magdeleney, August	Detroit, Hubbard Ave.	'88
Mann, F. C.	Detroit, 20 Monroe Ave.	'88
MacKimmie, J. D.	Detroit, 28 Jefferson Ave.	'88
MacKimmie. J. A.	Detroit, 723 Fort St. West	'84
Madill, Thomas	Detroit, 120 Henry St.	'84
Malmgren, Gustav A.	Ishpeming	'87
Mann, Albert	Ann Arbor	'83
Mandigo, Della	Sherwood	'86
Mandigo, W. R.	Sherwood	'84
Mason, C. A.	Flint	'85
Mason, G. B.	Saline	'83
Marr, T. W.	Detroit, 333 Woodwaod Ave.	'85
Martin, A. F.	Imlay City	'84
Martin, C. L.	Elk Rapids	'84
Martin, Henry	Jackson	'84
Martin, Susie A.	Hopkins Station	'85
Martty, F. O.	Ann Arbor.	'87
Mayer, F. W.	Sebawaing	'84
Maxson, M. M.	Hudson	'85

		ELECTED
McDonald, David	Kalamazoo	'84
McDonald, D. T.	Red Jacket	'83
McDonald, George	Kalamazoo	'83
McDonald, Murdo	St. Johns	'85
McEvoy, J. E.	Manistee	'85
McFarland, A.	Detroit, 693 Michigan Ave.	'83
McFarland, Wm.	Detroit, 506 Michigan Ave.	'84
McHenry, G. A.	Chippewa Lake	'86
McKenna, J. D.	Shepherd	'84
McKibbin, R. S.	Detroit, 322 Fort St. W.	'88
McMillan, Neal	Rockford	'87
McMullen, G. H.	Ionia	'83
McMurtie, Fred. J.	Three Rivers	'89
McPhee, J. A.	Lake City	'87
Mead, H. L.	Escanaba	'84
Mead, J. N.	Escanaba	'83
Meigs, M. I.	Camders	'88
Mills, T. H.	Port Huron	'88
Merrell, F. P.	Ithaca	'83
Merrill, A. C.	Cross Village	'87
Merriam, C. K.	Ludington	'83
Meseroll, D. C.	Jackson	'84
Mesick, H. J.	Plainwell	'86
Meyers, John	Mt. Clemens	'83
Middleton, V. H.	Grand Rapids	'84
Miller, H. J.	Fort Gratiot	'85
Millikin, T. J.	St. Clair	'84
Millington, F. S.	Paw Paw	'83
Mills, L. M.	Grand Rapids	'86
Moeller, Jos. C.	Detroit, 74 Jay St.	'89
Moore, John	Ann Arbor	'84
Moore, W. B.	East Saginaw	'84
Mooreland, Charles	Hadley	'85
Morford, A. D.	Ypsilanti	'84
Morrison, A. W.	Constantine	'85
Morris, H. M.	Detroit, 919 Gr. River Ave.	'88
Morris, S. S.	Pincomming	'88
Mottram, J. H. H.	Detroit, (J. E. D. & Co.)	'83
Muir, J. D.	Grand Rapids	'86
Mulloy, Wm.	Minden	'84
Murphy, J. W.	Battle Creek	'83

		ELECTED.
Myers, A. W.	Gobleville	'84
Nash, C. P.	Detroit, (T. H. H. & Sons)	'88
Nasmyth, P. F.	Detroit, 388 Baker St.	'88
Nelson, E. H.	Detroit	'84
Nelson, Pascal P.	Northport	'87
Newell, C. P.	Flushing	'84
Niver, W. H.	Chesaning	'88
Norton, J. T.	Rochester	'88
Noble, M. L.	Sparta	'85
Noel, Gideon	Good Hart, Emmet Co.	'84
Northrup, B. D.	North Lansing	'83
O'Brien, J. R.	Detroit, 297 First St.	'85
Orr, J. J.	Tecumseh	'84
Orr, E. N.	Manistique	'86
Orth, L. P.	Traverse City	'86
Osborne, G. A.	Luther	'87
Osborne, W. E.	Grand Rapids	'85
Owen, W. H.	Maple Rapids	'86
Palmer, Henry	St. Johns	'89
Palmer, B. W.	Detroit, 836 Jefferson Ave.	'88
Padley, W. A.	Benton Harbor	'85
Paige, L. E.	Sparta	'86
Parker, A. S.	Detroit, 747 Woodward Ave.	'83
Parker, G. J.	Port Huron	'83
Parker, O. J.	Howell	'86
Parkill, C. P.	Owosso	'83
Parkill, S. E.	Owosso	'83
Parkinson, E. A.	Traverse City	'85
Paquette, F. D.	Ludington	'83
Passage, J. H.	Greenville	'86
Patenaude, A.	Norway	'87
Patterson, B. M.	———	'85
Pauly, L.	St. Ignace	'87
Peck, A. W.	Grand Rapids	'83
Peck, J. E.	Grand Rapids	'85
Peckham, H. C.	Freeport	'85
Pegg, H. D.	Morenci	'84
Penberthy, Edward	Iron River	'87
Perham, Jason	Kent	'88

		ELECTED
Perkins, T. W.	Detroit, 333 Woodward Ave.	'88
Perren, George L.	Detroit, 780 Jefferson Ave.	'88
Perry, D. B.	West Bay City	'83
Perry, F. W. R.	Detroit, 709 Woodward Ave.	'83
Pfeiffer, G. J. O.	Detroit, 527 Jefferson Ave.	'88
Phelps, L. A.	Saugatuck	'88
Phelps, L. E.	Flint	'84
Phillips, H. S.	Middleton	'88
Phillips, E. F.	Armada	'83
Phillips, F. S.	Ogden	'84
Phillips, W. R.	Battle Creek	'83
Pierson, L. R.	Kalamazoo	'88
Pike, N.	Morley	'86
Pinkerton, R. J.	Bancroft	'84
Pinckney, C. A.	Plymouth	'83
Piper, Fred H.	Lansing, 717 Ionia St.	'89
Pitcher, Sheldon	Detroit, 450 Fourth Ave.	'84
Platts, Randolph	Port Sanilac	'84
Plessner, Fred	West Bay City	'88
Poole, C. A.	Detroit, 647 Third Ave.	'88
Potter, H. W.	Jenisonville	'87
Power, J. O.	Addison	'84
Prall, D. E.	East Saginaw	'83
Pratt, G. O.	Detroit, 723 Antoine St.	'84
Pratt, Stephen	Howell	'85
Prescott, A. B.	Ann Arbor	'83
Preston, George	Escanaba	'85
Preston, T. W.	Milbrook	'86
Price, O. J.	Detroit, 485 14th Avenue	'83
Prittie, W. H.	Detroit, 402 Cass Avenue	'85
Purdy, H. D.	Fennville	'84
Purvis, G. A.	Detroit, 983 Jefferson Ave.	'85
Putnam, A. S.	Manistique	'88
Quick, J. B.	Howard City	'83
Raider, J. F. A.	Newaygo	'83
Raizon, James	Wakefield	'88
Randolph, A. M.	Northville	'83
Ray, G. C.	West Bay City (Banks)	'85
Raymo, Owen	Wayne	'88

		ELECTED.
Redmond, J. A.	Sandusky	'88
Reidy, Mike	Corunna	'84
Revell, Sam'l	Roscommon	'88
Reynolds, W. B.	Eaton Rapids	'83
Rice, C. E.	St. Clair	'88
Rich, J. W.	Manistee	'85
Richards, F. P.	Detroit, 204 Jos. Campau Ave.	'85
Richards, T. H.	Detroit, 780 Jefferson Ave.	'84
Richmond, T. W.	Bear Lake	'88
Ringler, Eugene	Saginaw	'84
Ripley, L. G.	Montague	'84
Ribbins, J. J.	Hubbardston	'83
Roberts, D. O.	Kalamazoo	'87
Robertson, B. J.	Breedsville	'84
Robinson, E. H.	Montreal, 81 St. Matthews St.	'88
Robinson, O. H.	Grand Rapids, 115 Chestnut St.	'88
Robinson, Wm. H.	Detroit, Fort St. W.	'88
Roche, W. J.	Lake City	'84
Rodenbaugh, H. W.	Breedsville	'87
Rodenbaugh, I. N.	Mancelona	'86
Rodenbaugh, O. L.	Mancelona	'85
Rodgers, E. J.	Port Huron	'84
Rogers, LeRoy	Irving	'86
Rogers, T. F.	Lakeview	'87
Rogers, A.	Ravenna	'88
Rogers, Arthur S.	Vassar	'89
Ross, E. W.	Detroit, 418 Cass Ave.	'83
Ross, W. H.	Grand Rapids, Mt. Vernon Ave.	'85
Roussin, V.	Ludington	'84
Royer, Jr., Theo.	Piqua, O.	'84
Ruchty, Louis	Detroit, 410 Gr'd River Ave.	'84
~~Ruddiman, Edsel A.~~	Detroit, 116 Jefferson Ave.	'89
Rudolphi, A. E.	Dowagiac	'86
Rudolphi, Louis	Dowagiac	'84
Rumer, J. F.	Richfield	'85
Rundel, J.	Holton	'86
Runner, J. W.	Shelby	'86
Rushmore, W.	Elk Rapids	'86
Sabin, C. E.	Centerville	'83
Sackett, S. M.	Monroe	'83

		ELECTED.
Safford, O. P.	Flint	'83
Sanford, Frank A.	Grand Rapids (White & Co.)	'89
Sawyer, R. J.	Menominee	'83
Sayers, J. A.	Seney	'85
Schaefer, Wm.	Carleton	'85
Schimmell, G. R.	————	'85
Schulz, L. S.	St. Joseph	'85
Schumacher, A. B.	Grand Ledge	'84
Schumacher, A. C.	Ann Arbor	'87
Schumacher, D. A.	Manistique	'84
Schott, A. A.	East Saginaw	'88
Scoville, G. R.	Manistee	'84
Seeley, C. A.	Lansing	'88
Seibert, G. F.	Iron Mountain	'83
Shaffer, John M.	Gladwin	'89
Sheldon, R. B.	Detroit, 453 Gr'd River Ave.	'88
Sheffield, W. E.	Benton Harbor	'84
Sherling, F. W.	Grand Rapids	'85
Sherlock, T. J.	Stetson, Oceana Co.	'85
Sherwood, C. L.	Dowagiac	'84
Shook, D. L.	Coral	'84
Sigler, F. A.	Pinckney	'85
Slawson, W. W.	Greenville	'86
Sloan, E. E.	Bancroft	'85
Smallidge, Frank E.	Detroit, Jefferson Ave.	'89
Smith, A. B.	Trenton	'84
Smith, A. L.	Crystal	'86
Smith, C. M.	Clarkston	'83
Smith, Fletcher	Saginaw	'83
Smith, Oscar W.	Detroit, (P. D. & Co.)	'89
Snodgrass, S. K.	————	'88
Snow, H. W.	Detroit, (F. Stearns & Co.)	'85
Snow, S. M.	Ludington	'83
Soule, C. A.	Eaton Rapids	'84
Spayde, W. H.	Bloomingdale	'86
Spencer, J. L.	Linden	'83
Spencer, M. Ella	Linden	'84
Sprague, W. G.	Flushing	'83
Stanley, C. D.	One Rama	'88
Stanton, H. N.	Sheridan	'85
Stanton, M. B.	Sheridan	'85

		ELECTED.
Starr, George E.	Plainwell	'87
Stearns, Fred.	Detroit	'84
Steele, Michael	Ionia	'85
Steketee, A. G.	Grand Rapids	'85
Steketee, G. G.	Grand Rapids	'85
Steiger, E. A.	Detroit, 714 Rivard St.	'88
Steinkohl, Fred'k	Manchester	'89
Stevens, A. B.	Ann Arbor	'83
Stevens, C. R.	Northville	'83
Stevens, F. D.	Detroit, 133 Woodward Ave.	'83
Stiles, T. P.	Chester	'86
Stone, C. G.	Detroit, 580 Lafayette Ave.	'84
Stover, H. E.	Kalkaska	'86
Strachan, J. D.	Muir	'88
Stringer, G. W.	Detroit, 898 Michigan Ave.	'84
Stringham, Wm. T.	Shelby	'88
Sullivan, J. H.	Whitehall	'85
Swaby, G. A.	West Bay City	'85
Swayze, E. S.	Otisville	'88
Sweet, B. F.	Carson City	'85
Sweetser, F. E.	Port Huron	'88
Swift, George	Detroit, 7 Griswold St.	'83
Swinnerton, W. W.	Niles	'88
Taylor, C. W.	Loomis	'85
Taylor, E. J.	Vassar	'84
Taylor, J. A.	Detroit, 148 Third St.	'84
Taylor, H. S.	Detroit, 54 Selden Ave.	'89
Terrill, B. E.	Muir	'86
Thompson, M. L.	Greenville	'88
Thompson, A. L.	Plainwell	'87
Thompson, Frank A.	Detroit, (P. D. & Co.)	'89
Thum, Hugo	Grand Rapids	'84
Tibbits, A. H.	Port Huron	'85
Tibbs, W. H.	Grand Rapids	'86
Tillitson, W. J.	Laingsburg	'86
Tillson, Fred. P.	Ishpeming	'87
Tilton, B. E.	Bay City	'85
Tobey, N. I.	Sturgis	'84
Todd, A. M.	Nottawa	'87
Todd, F. J.	Detroit, (J. E. D. & Co.)	'86

		ELECTED.
Todd, W. F.	Flint	'83
Tomlinson, W. A.	Au Sable	'84
Torontaly, Paul	East Tawas	'85
Travis, F. A.	St. Johns	'85
Treat, A. B.	Adrian	'84
Tredwell, J. H.	Detroit, 51 Shelby St.	'85
Trombly, C. K.	Detroit, 594 Gratiot Ave.	'88
Tubbs, C. C.	Chesaning	'83
Tullgren, A.	Iron Mountain	'86
Tupper, F. L.	Meredith	'85
Turner, D. D.	Whitehall	'84
Turner, R., Dr.	Flat Rock	'86
Tuttle, W. A.	Grand Ledge	'83
Tweedale, J. R.	Muskegon	'84
Van Bochove, R.	Grand Rapids	'86
Vandecar, J. H.	North Branch	'83
Vanden Belt, Nicholas	Detroit, 33 Lafayette Ave.	'84
Van Slype, N. F. L.	Detroit, 255 St. Aubin Ave.	'88
Van Wickle, F. W.	Sheely	'88
Van Leeuwen, W. H.	Grand Rapids	'85
Van Marter, Ezra	Jackson	'84
Van Vranken, G. D.	Cadillac	'85
Varnum, E. C.	Jonesville	'84
Varnum, G. C.	Jonesville	'84
Vaughan, B. D.	Bellevue	'84
Vedder, E. H.	West Bay City	'85
Vennema, H. A.	Menominee	'85
Vernor, James	Detroit, 235 Woodward Ave.	'84
Vining, Cary W.	Lakeview	'89
Voller, J. H.	Evart	'86
Wagener, C. H.	Big Rapids	'83
Wagner, A.	Eastmanville	'86
Waite, G. W.	Coldwater	'84
Wait, S. E.	Traverse City	'84
Waldorf, A.	Detroit, 838 Mich. Ave.	'88
Walker, W. K.	Lansing	'83
Walker, A. L.	Detroit, 415 Woodward Ave.	'88
Walsh, Heber	Holland	'85
Walthausen, G. L. F. von	Bay City	'85

		ELECTED.
Walthausen, Werner von	Bay City	'84
Waples, Grafton	Detroit, 930 Michigan Ave.	'84
Ward, G. J.	St. Clair	'84
Ward, W. A.	Eau Claire	'84
Warne, F. C.	East Jordan	'86
Warner, S. H.	Marlette	'86
Warner, W. A.	Detroit, (T. H. H. & Sons)	'84
Warren, W. M.	Detroit, 525 Jeff. Ave.	'88
Watson, J. B.	Coopersville	'84
Wastele, Wm.	Port Huron	'88
Watson, R. A.	Detroit, 764 Fort St. W.	'88
Watz, H. G.	Saginaw	'84
Webb, B. S.	Alma	'86
Webb, H. J.	Cassopolis	'88
Webb, E. T.	Jackson	'85
Webber, A. H.	Big Rapids	'84
Weeks, A. A.	Grand Rapids, 256 Plainfield Ave.	'87
Weeks, James E.	Battle Creek	'89
Weise, H. L.	Detroit, 592 McDougall Ave.	'84
Weiss, J.	Monroe	'88
Wells, C. A.	Yale	'86
Wells, Frank	Lansing	'83
Wetzell, H. A.	Detroit, 821 Jeff. Ave.	'88
Wheeler, C. F.	Hubbardston	'84
Whelpley, B. I.	Hoytville	'84
Whipple, G. N.	Detroit, 222 Orleans St.	'85
White, L. T.	Eaton Rapids	'83
White, W. E.	Grand Rapids	'86
White, W. L.	Grand Rapids	'84
Whitton, R. L.	Burnep's Corners	'84
Wicker, C. D.	Coldwater	'83
Wiede, Henry	Reese	'83
Wiesinger, J. G.	Detroit, Cor. 12th and Baker	'84
Wiggins, A. H.	Lawrence	'85
Wilber, C. H.	St. Ignace	'87
Wilcox, Geo. D.	Eaton Rapids	'89
Wilders, A. J.	Ortonville	'85
Wilder, E. P. B.	Oxford	'88
Wilkins, F. C.	Union City	'85
Willard, H. W.	Manistee	'85
Willard, Thomas	Bear Lake	'85

		ELECTED.
Willett, Frank, Dr.	Monroe	'88
Williams, H. M.	Mason	'85
Williams, W. C.	Detroit, (W. S. & B.)	'84
Williamson, G. E.	Vassar	'85
Williamson, John	Detroit, 81 Woodward Ave.	'84
Williams, R. P.	Detroit	'88
Williams, C. F.	Caledonia	'88
Williams, J. P.	Climax	'88
Wilson, E.	Stanwood	'87
Wilson, E. R.	Grand Rapids	'87
Wilson, G. A.	Charlevoix	'84
Wilson, M. V.	Sand Lake	'86
Wilson, W. B.	Detroit	'83
Windover, W. V.	Dotroit, 1328 Woodward Ave.	'88
Witherspoon, G. A.	Chatham, Ontario	'85
Witherspoon, P. E.	Harrison	'85
Wolfinger, C. E.	Hopkins Station	'84
Wood, Will H.	Sheridan	'87
Wood, Wm. A.	Six Lakes	'88
Woods, T. T.	Belleville	'85
Woods, C. H.	Detroit, 524 Grand River Ave.	'88
Woolford, R. S.	Mecosta	'86
Woolsey, F. F.	Hartford	'84
Worcester, W. N.	Coldwater	'88
Wright, Charles	Detroit, 15 Jefferson Ave.	'83
Wright, C. A.	Tecumseh	'84
Wright, E. A.	Pentwater	'85
Wurzburg, F. J.	Grand Rapids	'84
Yates, H. W.	Big Rapids	'88
Yeomans, E. T.	Ionia	'83
Young, C. A.	Battle Creek	'84
Young, E. A.	Clio	'86
Young, S. E.	Lakeview	'88
Zimmer, Wm. A.	Manistee	'88

HONORARY MEMBERS.

		ELECTED.
Douglas, S. H., M. D.	Ann Arbor	'86
Duffield, S. P., Ph. D., M. D.	Detroit	'87
Englehard, G. P.	Chicago, Ill.	'83
Stowell, Mrs. L. R., M. D.	Washington, D. C.	'87
Vaughan, V. C., Ph. D., M. D.	Ann Arbor	'87
Wrampelmeier, T. J., Ph. C.	San Diego, Cal.	'87

RESIGNED.

Clark, J. F., Climax.
Dodds, W. H., Detroit.
Fink, L. C., Detroit.
Green, A. L., Layfette, Ind.
Goodyear, J. J., Ann Arbor.
Hartz, H. J., Detroit.
Jefts, W., Big Rapids.
Kotcher, C. W., Detroit.
Le Feore, Geo. L., Muskegon.
Plaat, C. W., Grand Rapids.
Saltzer, A. B., Detroit.
Trowbridge, T., Decatur.
Thompson, H. G., Menekanum, Wis.

DROPPED FOR NON-PAYMENT OF DUES, '89.

Arnold, W. C.,
Bailey, Geo. H.,
Barbour, W. G.,
Barbarien, G. F.,
Bird, Henry, Jr.,
Bisbee, A. B.,
Blocher, Chas.,
Bond, E. C.,
Brooks, Charles,
Brown, I. V.,
Bullock, S. V.,
Bigelow, C. P.,
Carroll, M. A.,
Carroll, W.,
Cole, W. W.,
Covert, C. F.,
Escott, F. H.,
Erskine, Jas.,
Farnham, E.,
Federer, E. C.,
Fehlig, H. J.,
Feldman, H.,
Fugua, C. B.,
Gallinger, E. L.,
Gates, E. M.,
Gibbs, N. C.,
Gossuch, C. H.,
Halsey, L. J.,
Harvey, E. T. C.,
Harvey, T.,
Herley, M. L.,
Herrington, J. A.,
Hicks, W. L.,
Hitchcock, W. A.,
Humphrey, C. E.,
Hunt, F. J.,
Johnson, C. B.,
Joslen, O. C.,
Kelly, David,
Kellogg, J. H.,
Kellogg, J. L.,
Kibbie, A. D.,
Kimm, D.,
Kimm, M. B.,
Keusel, W. S.,
Lacy, E. M.,
Lee, E. D.,
Longwell, E. B.,
Mahon, F. M.,
Martyn, W. J.,
Maynard, T. C.,
Merrill, M. C.
Meyers, J. K.,
Miles, J. B.,
Miller, N.,
Milner, C. H.,
Millspaugh, G. D.,
Morison, Thos.,
McCoy, W. B.,
McCrae, H. F.,
McInnes, M. V.,
McLean, C. E.,
McNeal, Byron,
Newman, E. P.,
North, S. J.,
Norris, J. L.,
Noyes, K. W.,
Nurney, James,
Osborn, C. A.,
Parkhurst, C. G.,
Pease, J. F.,
Perrigo, L.,
Reasner, F. M.,
Reed, S. M.,
Richardson, Geo.,
Robson. W. L.,
Rowe, Wm.,
Roys, H. M.
Schanher, J.,
Schlieper, F. A.,
Seed, A. W.,
Siebert, M. L.,
Severson, W. A.,
Sherman, H. B.,
Shotwell, R. H.,
Smith, F. D.,
Smith, H. W.,
Snyder, M. H.,
Sorg, H. A.,
Sprague, O. L.,
Stevenson, W. E.,
Stevenson, A. W.,
Strong, J. L.,
Suffield, B.,
Ticknor, Geo.,
Trempe, J.,
Tucker, W. S.,
VanderVeen, J.,
Vincent, J. T.,
Vyne, N. A.,
Wagar, F. G.,
Waite, C. M.,
Wales, T. P.,
Wallace, G. E.,
Watts, Isaac,
Watson, W. O.,
Wells, L. B.,
Wheat, J. H.,
Wheelock, N. L.,
White, A. F.,
Whitfield, G. F.,
Willson, L. S.,
Wolf, J. G.,
Wood, J. E.,

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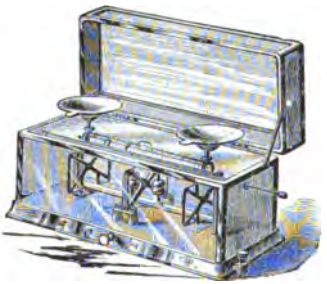
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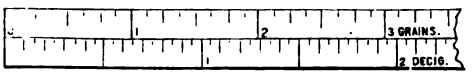
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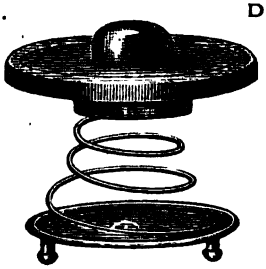
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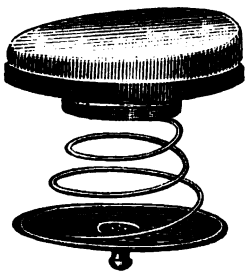
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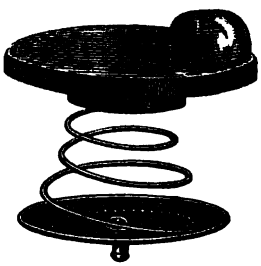
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Michigan State

Pharmaceutical

Association.

Proceedings Eighth Annual Meeting

1890

PREPARATIONS FOR
QUININE & CINCHONA
AND VEHICLES FOR ADMINISTRATION.

How do you administer quinine? Are you acquainted with the many forms in which it may be given?

The utility of a remedy depends largely upon its genuineness, its purity, and its preparation in that form which is best adapted to meet the particular conditions or indications for its use. Modern pharmacy has achieved most important and useful results in the direction of improving the quality of remedies, of rendering them easier of administration and absorption, and better adapted for the purposes for which they are required. By this means, also, the range of therapeutic application of many remedies has been extended.

Among preparations of remedies which we have done much to improve, we desire to briefly call attention to those of Quinine and Cinchona, to which we have given much study, and which justify us in claiming them to be superior to any other at the command of pharmacists.

We can merely mention here the names of the various classes of these preparations we make; an indexed descriptive list of all of them, and of our other manufactures, will be mailed to pharmacists requesting it.

PREPARATIONS OF CINCHONA AND ITS ALKALIDS.

These preparations comprise: Fluid Extract Cinchona Aromatic; Fluid Extract Cinchona Calisaya, U.S.P.; Fluid Extract Cinchona Compound; Fluid Extract Cinchona, pale; Fluid Extract Cinchona, red; Fluid Extract Cinchona, red comp.; Liquid Cinchona Calisaya, normal; Liquid Cinchona, red, normal; Elixirs of Calisaya Alkaloids and Barks, and a variety of convenient combinations of these with other medicinal agents in the form of Elixirs; Wine of Calisaya; Syrup of Iron and Quinine Citrate; Syrup of Iron, Quinine and Strychnine; Red Cinchona Cordial; Soluble Elastic Capsules of Quinine, 2 to 5 grains; Hypodermic Tablets; Tablet Triturates; Granules, Lozenges, Oleates and Pills of Quinine, Cinchonine and Cinchonidine, alone or in combination with other tonic agents largely prescribed.

Our Pills are invariably made to meet the following requirements: Permanency, purity, accuracy of ingredients, solubility permitting of absorption in even impaired condition of the alimentary tract.

QUININE HYPODERMICALLY.

The majority of physicians do not administer quinine hypodermically, owing to the fact that it is supposed that it causes irritation, pain and possible induration and suppuration. If a proper solution is carefully used, however, there is little danger of this. We quote from Bourneville & Bricon's work on Hypodermic Medication as follows on this topic:

"Glycerine is often the best vehicle. It dissolves one part in six by weight, by means of heat, but when cold only three per cent. The following solution is however, more desirable for hypodermic use, viz: R Muriate Quinine (P., D. & Co.) 32 grains; Dilute Hydrochloric Acid, 15 minims; Distilled Water, up to 160 minims (5 minims of this solution is the equivalent of 1 grain of quinine.) This solution preserves its limpidity without any precipitate for several months."

VEHICLES FOR QUININE.

Quinine may be administered, when there exists special abhorrence of it, by capsule, by inunction of the oleate, and hypodermically. There are also many vehicles for its administration. Probably the choice of these are the preparations made of Licorice and Yerba Santa. An article entitled: "Vehicles for Quinine," containing suggestions as to the use of the following preparations as vehicles for Quinine will be mailed to pharmacists requesting it: Fluid Extract Licorice for Quinine; Aromatic Syrup Yerba Santa; Elixir Dandelion Comp.; Elixir Eucalyptus Comp.; Elixir Licorice Aromotic; Cascara Cordial.

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PROCEEDINGS

OF THE

MICHIGAN STATE

Pharmaceutical Association

AT ITS

EIGHTH ANNUAL MEETING,

HELD AT

SAGINAW,

September 16th, 17th and 18th,

1890.

ALSO, THE

CONSTITUTION AND BY-LAWS,

ROLL OF MEMBERS, ETC.

CHEBOYGAN, MICH.:
DEMOCRAT BOOK AND JOB PRINT.
1890.

NOTICE.

MEMBERSHIP.

Blank applications for membership will be furnished by the Secretary upon request.

Attention is called to the change in Article II of the By-Laws whereby applicants for membership are elected by the Executive Committee.

PROCEEDINGS.

Extra copies of the Proceedings can be obtained of the Secretary at fifty cents each.

N. B.—If you change your residence, if your name or address is incorrectly given in the Membership Roll, or if you learn of the death of a fellow member, please notify the Secretary at once.

The next annual meeting of the Association will be held in Ann Arbor about the third week in October, 1891. The exact date to be fixed upon later by the Executive Committee.

C. A. BUGBEE, Secretary,
Cheboygan, Michigan.

The Editor desires to acknowledge the valuable assistance given him by Mr. Parsons, of the *Era*, and Prof. Prescott in getting out the Proceedings.

Officers of the Association.

1890-91.

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Committees, 1890-91.

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G. T. WARD.....ST. CLAIR.
C. W. HULL.....BAY CITY.

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H. A. BLACKMAR.....CHARLOTTE.

To Submit Contributions to Pharmacopoeia Revision Committee.

A. B. STEVENS.....ANN ARBOR.
O. EBERBACH.....ANN ARBOR.
H. W. SNOW.....DETROIT.

To Secure Expression of Members on Names to Present to the Governor for Member Board of Pharmacy.

D. O. HAYNES.....DETROIT.
J. W. CALDWELL.....DETROIT.
FRANK INGLIS.....DETROIT.

Delegates.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Meeting at New Orleans, La., 1st Monday in May, 1891.

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J. G. HOGEBOOM, Saginaw.	F. A. THOMPSON, Detroit.
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GEO. MCDONALD, Kalamazoo.	A. BASSETT, Detroit.

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ILLINOIS.

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D. E. PRALL, Saginaw.

Michigan State Board of Pharmacy.

GEORGE McDONALD, Kalamazoo,	Term expires Dec. 31, 1890.
STANLEY E. PARKILL, Owosso,	Term expires Dec. 31, 1891.
JACOB JESSON, Muskegon,	Term expires Dec. 31, 1892.
JAMES VERNOR, Detroit,	Term expires Dec. 31, 1893.
OTTMAR EBERBACH, Ann Arbor,	Term expires Dec. 31, 1894.

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For place and date of meetings for the examination of candidates, or other information, apply to JAMES VERNOR, Sec'y, Detroit.

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V. H. MIDDLETON, Grand Rapids.

W. W. SWINNERTON, Niles.

MORRISON BAILEY, Plainwell.

H. W. CLEVELAND, Nunica.

J. J. SULLIVAN, Whitehall.

I. J. LEGGETT, Paris.

DR. S. H. DOUGLAS, Honorary Member.

PROCEEDINGS

OF THE

EIGHTH ANNUAL SESSION

OF THE

MICHIGAN

STATE PHARMACEUTICAL ASSOCIATION,

HELD AT

Saginaw, Michigan, Sept. 16, 17 and 18, 1890.

FIRST SESSION.

Tuesday, Sept. 16th, at 2 o'clock p. m., the Association was called to order by the President, Mr. Frank Inglis, of Detroit.

Prayer was offered by the Rev. George F. Warren, D.D., of Saginaw.

An address of welcome was then delivered by Mr. George W. Weadock, Mayor of Saginaw, to which Mr. James E. Davis, of Detroit, responded.

The President then delivered his annual address, the main features of which were as below:

Ladies and Gentlemen of the Michigan State Pharmaceutical Association:

"The object of our association is to help one another, and to help ourselves. There are about two thousand druggists in the State, and that many of them need help, and need it badly, there is no doubt. We need help of a scientific nature; many of us have not had the benefit of a college education, and we enjoy hearing the valuable and interesting papers from our more fortunate members. Some of us may be engaged in business where the knowledge obtained from hearing these papers read and discussed is of little use to us, but still we enjoy them. To know how to make our preparations properly, pleasing alike to the eye and to the palate, is a knowledge we all wish to acquire. There are those among us that are abundantly able to help in this way, a number of papers on such subjects will be presented at this meeting, and that they will be appreciated and enjoyed goes without saying.

Now, we need help in another direction. We must consider the mercantile side of our profession. We have questions of great importance staring us in the face. It is doubtful if there is a store in the state of Michigan that can pay its expenses from the profits of its prescription department. What lines of goods can we handle at a profit? Are we to meet the prices of the cut rate dealer, the grocer, the bazar man, and similar merchants who handle cheap and inferior lines of goods to which they attract the public attention by advertising some leading patent medicine or well known toilet preparation at cost price? Will we continue to handle patent medicines, the proprietors of which care little or nothing for our interests now that they have used us all they can and have introduced their goods to the public through us? Now they snap their fingers and by their manner intimate to us that we can go to that country where no toilet articles are needed, where only preparations soothing to the parched and burning skin are in demand. Many druggists in the smaller cities object very seriously to the manufacturers and wholesale dealers supplying the physicians direct. What can we do about it? Will it not be a good idea for us to handle such goods as are sold only directly to the retail trade, or, if to the jobber, only on condition th.t he in turn will sell only to retail druggists who will maintain regular prices?" (The President here read the plan proposed by the Ramsey County (Minn.) and Minneapolis Pharmaceutical Associations for the regulation of this evil.)

This, in my estimation, hits the nail square on the head, and if we can unite on a similar plan we can soon bring the manufacturers to time. If we join hands and say, if you don't get and keep your goods out of such and such dealers' hands until such time as they agree to sell them at regular prices, we, two thousand druggists, will not sell them, and will use every endeavor to push preparations of our own and others' manufacture, how long do you suppose it would be before prices would be restored? Not long; the manufacturers would soon have men on the ground and see that their goods were where they belong, in the hands of the drug trade.

There are many household remedies which we can prepare ourselves, preparations that we can recommend to our customers. These will afford us a fair profit and also serve as an advertisement of our stores. In offering these preparations let us exercise a little ingenuity; do not copy after your neighbor, or after any one else, offer something put up in an original style. A man, even a patent medicine man, is entitled to the profits of his own enterprise, and it is small business for another to try and rob him of it.

It is sincerely hoped that every member will join in the discussion of papers presented at this meeting. Let us have a free expression of opinion. If you agree with what is said, get up and say so. If not, let us have your opinion on the subject. * * * * * In this way you will add to the interest of the meetings, and every moment will be fully taken up. * * * * We should devote more time to the consideration of matters pertaining to trade interests. Do not understand me as wishing to cut down or discontinue the reading or discussion of papers of a scientific nature. Far from it, but there are many of our members whose business is such that a meeting devoted entirely, or nearly so, to subjects of this character, has very little of interest to them. Whereas, if we present a number of papers on live business topics we will soon have them interested in papers and discussions of all kinds. By adding to the interest of our meetings, we can, in my opinion, add largely to our membership; add to our numbers and increase our usefulness. * * * *

At our last meeting it was decided to pay fifty dollars towards the expenses of each of three delegates to attend the convention for the revision of the Pharmacopoeia, but our secretary informed me that he hardly thought we would have sufficient money to meet this expense, after paying other necessary expenses. After consultation we came to the conclusion to appoint one delegate and pay his actual expenses, and save money to the Association. Mr. C. W. Parsons was

appointed on these terms. His bill of expenses shows that it was economy to act as we did. Mr. F. A. Thompson was appointed additional delegate, and represented us at his own expense. Mr. D. O. Haynes, chairman of the committee on new members, has been particularly active in securing new members, and his efforts have been rewarded. Mr. Colman, of the committee on trade interests, assisted by Messrs. Rogers and Pauly, have done good work, while the committees on Adulterations and on Pharmacy and Queries have not been idle, as will be shown during the meeting. The committee on legislation has had no work to do.

That there is a good deal of feeling in regard to the continued re-appointing of members of the Board of Pharmacy, there is no question. A large number of our members have an idea, and have expressed it freely to me during the past year, that it is time for a change, and that a change should be made each year. That the present Board is composed of competent men and thorough gentlemen, no one questions. But out of a membership of nearly one thousand, it is argued, certainly one can be found each year fully competent to serve on this Board. * * * * Now, we have plenty of excellent men, who have never been honored with a prominent office, who could be induced without much trouble to become members of this Board, and who would be an honor to it. What do you say to giving them a chance? In regard to this Association recommending two or more names to the Governor from which to choose a member of the Board of Pharmacy each year, the following correspondence is submitted:

DETROIT. Aug. 6, 1890.

"Honorable Cyrus G. Luce. Governor, Lansing, Mich.

DEAR SIR—At the last meeting of the Michigan State Pharmaceutical Association, some discussion was had relative to the constituency of the State Board of Pharmacy. Some of the members of the Association while recognizing the propriety, as well as the right, of the Governor appointing as members of said Board such persons as seemed to him wise, yet thought that, inasmuch as the Board of Pharmacy owes its inception to the efforts of the Pharmaceutical Association, when any vacancy should occur in said Board, the Governor might not be unwilling to have the Association suggest as possible appointees the names of two or more of its members. The Association does not wish in any respect to seemingly put itself in the position of attempting to dictate; but would be pleased to receive from the Governer an expression of his views as to whether he deems it proper for the Association to send in two or more names for his consideration when he may be called upon to make an appointment to fill a vacancy in said Board.

Very Respectfully,
(Sgd.) FRANK INGLIS,
Pres. M. S. P. A."

(Dictated)

EXECUTIVE OFFICE, MICHIGAN.
LANSING, August 6, 1890.

Frank Inglis, Detroit, Mich.

DEAR SIR—Your communication of August 5th has reached this office in the absence of the Governor. He went away yesterday and will not return until Saturday evening, hence you will pardon me for making reply without his direct sanction.

I am very sure that the Governor would be pleased with any recommendation that might be made by the Pharmaceutical Association; in case of vacancies he would consider the same most carefully. I hardly think that he would feel like acknowledging himself bound to make appointments in conformity with such recommenuations in advance, but they would have great weight with him. It has not thus far been the aim of the Governor in making appointments to fill positions of trust in this state to make such selections entirely or solely for political services; but rather, fitness for the position named; though not, of course, failing to recognize the political faith of his party wherein it was proper for him so to do.

His highest aim has been to appoint men who would honor the positions to which they were to be appointed. Of course the object of your society is the elevation of the profession and such being the case, your recommendations, with the knowledge you possess, would be of great value to the executive in making his selections.

Knowing the Governor's attitude in these matters so well, I have ventured to write what I am sure would be his reply were he here. The Governor has tried to be very cautious, and has acted only upon the best light that he could obtain in exercising his appointing power, and it is from association with him and knowing the motives that actuate him that I have written this much.

Very truly yours,
MILO D. CAMPBELL, Private Secretary.

This, to my mind, shows conclusively that the Governor would not consider it an unwarranted interference on our part as some of the members have contended, but rather a help to him. Let us try it and see what the result will be.

At the last meeting of the Michigan Medical Society a delegate was appointed to attend our meetings here; it is hoped he will be present. It seems to me an excellent idea, that two professions so closely allied should have representatives at each others' meetings. They have expressed a desire to have us send a delegate from our Association to represent us at their next meeting. This should be done. No delegates were appointed to attend the meetings of the various state associations. It was my pleasure to attend the meeting of the Ohio association, which was very pleasant and well attended. * * * *

Your choice of a president at your last meeting seemed at the time a strange one, but the wisdom of it can now be seen; there has been nothing for him to do during the past year, and no one could have done it better. Allow me at this time to thank you for the honor conferred upon me and for the many courtesies shown me during the past year. Everything has passed off pleasantly and if this meeting is a success, my cup of happiness will be full."

On motion address was referred to a committee, consisting of Mr. Bassett, Mr. Fisher and Mr. Hinds.

Mr. Vernor, the Secretary of the Board of Pharmacy, then submitted his report, which is as follows:

To the Michigan State Pharmaceutical Association:

GENTLEMEN—In compliance with the law I have the honor to submit herewith the Annual Report of the Michigan Board of Pharmacy, for the fiscal year ending July 7th, 1890.

The Board has held two special meetings during the year, one for the purpose of preparing questions for the examinations, and the other for the purpose of examining the Secretary's books previous to transferring them to his successor. There have also been held the three regular meetings for the examination of candidates for registration, as prescribed by law, and at which there were examined 294 applicants for certificates as "Registered Pharmacists," and 39 for those of "Registered Assistant Pharmacist," granting 165 to the former and 66 to the latter, the excess in the latter being accounted by a rule of the Board, under which "Assistant" certificates are granted to those who desire them among the candidates, who failing to pass a full and satisfactory examination, yet pass sufficiently high to warrant the Board to issue to them certificates as assistants.

The Board has received and disbursed monies during the year as follows:

RECEIPTS.

From 244 applications for examination, registered pharmacists, at $3.00	$ 732 00
" 87 " " " assistants, at $1.00	87 00
" 2740 renewals of certificates, at $1.00	2,740 00
" 184 " " " at 50c	92 00
Total	$3,651 00
Balance on hand at last report	1,386 38
	$5,037 38
Disbursed as per accompanying vouchers	3,724 84
Cash in the hands of the treasurer	1,312 54

The Board in its last annual report gave the number of pharmacists and assistant pharmacists registered in the state as:

	Pharmacists.	Assistant.
Highest register number, July 7th, 1889	3,312	374
Dropped from the rolls	488	122
In force July 7th, 1889	2879	252
Added during the year	165	66
	3,044	318
Dropped during the year	138	82
In force July 7th, 1890	2,906	236
Dropped to date	571	204
Highest register number July 7th, 1890	3,477	440

There have been seventy complaints received during the year, for violation of the Pharmacy Law, which number added to those previously reported, makes the total number to date 219.

There are ten cases in the hands of our attorney at the present time. The attorney has secured fifteen convictions during the year, which added to the twenty previously reported, makes twenty-five convictions, from the time the law went into effect. The total cost of this work has amounted to $2,847.03. The fines imposed aggregating $424.

Herewith find a copy of the names of those persons who are registered under the law, and whose certificates are in force at the present time.

Respectfully submitted,

JAMES VERNOR,

Detroit, July 7th, 1890. Secretary,

The report, on motion of Mr. Davis, was received and placed on file.

The reports of standing committees and of delegates to other associations being now in order, Mr. C. W. Parsons, of Detroit, delegate to the Pharmacopœial Convention, read a full report of the convention, substantially as published in the various journals, after relating the routine work of the convention, the election of officers, and the appointment of the committee of revision, the report proceeds:

"The question of copyrighting the forthcoming Pharmacopoeia was liberally discussed, and several motions were made for the instruction of the committee, some of these plans being somewhat absurd in character, but the whole question was finally left to the good judgment of the committee, who will doubtless see to it that this matter is adjusted more satisfactorily than was possible under the circumstances prevailing ten years ago, when the committee from the lack of funds, and may it be said lack of sufficient credit, were unable to secure such satisfactory terms as can now be made. The committee is now in possession of sufficient funds for carrying on the work, and can if it chooses bring it out in highly creditable form, and at considerable profit to itself.

The principal part of the report of the former committee consisted of a printed sheet presenting a draft of the general principles which are to be taken as a guide of the next committee, that of 1890. This draft consisted of fifteen sections, each one of which was taken up in turn, liberally discussed, and after being amended to the satisfaction of the convention was formally adopted. (The draft of principles for the guidance of the committee was here read, but is omitted, as it has been widely published in the pharmaceutical journals).

The most important questions considered were, first, the introduction of assay processes for drugs and galenical preparations. The report of the committee was very conservative, and yet of such a character as to satisfy some of the most enthusiastic advocates of the principles of standardization. As will be seen by refer-

ence to sections 2, 3 and 4, the committee is given power at its discretion to adopt such requirements of definite strength or percentage of active principles in drugs and their preparations as is possible from our present knowledge of the constituents and methods for the valuation thereof. This action on the part of the old committe was a very shrewd one, as the advocates and the opponents of standardization each considered it a victory for their own cause, and so it is. The new Pharmacopœia will doubtless contain assay processes for certain drugs when such can be presented as accurate and easy of determination.

Proprietary and patented articles, by adoption of article 7, will be rigidly excluded from the Pharmacopœia. The convention recognized the value of certain chemicals coming under this ban, but felt that in adopting another course they would be but opening the door to a host of articles of unknown composition, and of doubtful therapeutic value.

Without a dissenting vote it was decided to hereafter express all chemical formulas in the new notation only.

But it was when the convention came to the consideration of section 10 that the real fight, or, to be moderate, disagreement, between the members was made apparent. This section recommended that the Metric System be exclusively employed in the Pharmacopœia for the weighing of solids and the measurement of liquids. This section was deemed so important, and the discussions promised to be so long, and possibly heated, that a whole session was set apart for its consideration. Therefore, a few of the remaining sections of the draft were quickly adopted in order to dispose of them before the expected wrangle over section 10.

Friday morning the session was opened by a most entertaining address by Prof. T. C. Mendenhall, of the U. S. Coast Survey, who spoke of the history of the Metric System, with special reference to its adoption officially by the U. S. Government. He exhibited models of the official standards of the meter and kilogram, and his remarks throughout elicited cordial applause, and upon their conclusion he received the hearty thanks of the convention. (This address will be found in the various pharmaceutical journals).

Section 10 was then taken up, all speakers being limited to five minutes, and none were allowed to speak a second time. Speeches came thick and fast, and contrary to the expectation and belief of many present, for each speech against the Metric System ten were to be found in its advocacy. Of all the objections urged against it, without exception they were found to result from imperfect knowledge of the Metric System, and when certain difficulties were explained, in many cases the former opponent became its adherent. Two or three (pharmacists and physicians both) objected to its adoption because they felt themselves unable to buy a new balance or set of scales, but someone kindly informed these lily posted gentlemen that their objection was not well taken, as a good balance would tell weight in grams as well as in ounces, and would still measure the force of gravity whatever system of weights was used, and that all that would be necessary in changing from one system to the other would be the purchase of a set of weights, and a few hours' study of the system itself.

There are many who will seriously object to the adoption of the Metric System to the exclusion of all others, and there are certain objections to it, but it is believed that when once understood by both physician and pharmacist it will be found highly satisfactory—at the least, much superior to the irrational and most inconvenient system of weight and measure now employed.

The objection that physicians will not prescribe in Metric System, and therefore that the Pharmacopœia should not include it, is believed to be untenable, as it is not necessary that physicians should prescribe in grams or cubic centimeters. The pharmacist can make his preparations by whatever system he choose, and their composition will be the same, whether made by measurements in grams and cubic centimeters, or in ounces and pints. It will be found far easier to manufacture and to price goods by the employment of the Metric System, the principal

objection to it being when it comes to its translation into the systems now in vogue; that is to say, when the patient or physician asks how many grains in a teaspoonful of a certain medicine, the pharmacist must resort to a little calculation. It will not be possible at present to do away with the use of teaspoons and ounces, or the employment of the terms "grains" and "drops," but this reform will come with time. The earnest consideration of the question by the pharmacist will be necessary to the success and usefulness of the new Pharmacopœia, and no weight should attach to the objections and criticisms of those who have not carefully studied the advantages and disadvantages of both the old and the new. Those who have thus weighed the merits of the question, will, it is believed, become the adherents of the new system. The advisability of presenting equivalents of Metric terms in Apothecary's weights and measures was liberally discussed, and such proceedure had many advocates, but the general sense of the meeting was that a half-hearted reform would be no reform whatever, and that if alternate weights and measures were given, and the choice thus set before the reader, he would naturally turn to that most convenient for his use and the one with which he is most familiar, and would therefore neglect to study the proposed system. By excluding these equivalents, if one desires to manufacture a preparation according to the old systems, he must first calculate to get its quantities from the Metric equivalents, thereby becoming familiar with the new system and its conversion into terms of the old. A slight modification of the general principle of solids by weight and liquids by measure was allowed in the case of certain solids and thick or corrosive liquids, where it would be advisable to use weight only.

There was submitted a proposition that 10% should be the strength of wines, spirits, tinctures, and dilute acids; 5% for infusions and decoctions, and 50% for fluid extracts, and these with other recommendations were submitted to the new committee for consideration. A plan was also offered for the organization of the convention in 1900 based upon a division of states into congressional districts, each district sending an equal number of pharmacists and physicians. This proposition was submitted also for action. A most pleasing event occurred when in a graceful speech a member paid high tribute to the value of the labors of the past and present Chairman, Dr. Rice, and a motion was unanimously carried to the effect that $1,000.00 be paid him in recognition of his valuable services. Dr. Rice, in reply, while deeply appreciating the kindness which prompted the motion, stated that he would accept such sum, but begged to be allowed to endorse the check and return it to the Treasurer of the committee.

For a detailed account of the proceedings of the convention, your committee would refer you to reports in the various journals; and likewise to the one attached, which was prepared by your committee.

The delegates were most cordially entertained while in Washington, attending a reception by the President, spending a most delightful evening at the residence of Mr. Waggaman, and participating in an excursion to Mt. Vernon, and enjoying a clam bake upon the return; visits to the Government buildings, botanical excursions, and entertainments provided for individuals or small parties by the many scientists and professional men resident in Washington, were enjoyed to the utmost by a number of the favored ones.

Your committee would suggest that this entire matter of the next revision of the Pharmacopœia be earnestly considered by this association, and that a proper committee be selected to gather, digest, and forward to the committee such recommendations, suggested improvements, alterations, etc., as may seem in their best judgment fitted to enhance the value of the Pharmacopœia of 1890. It is only by such action that the committee becomes informed regarding the wishes of the body of pharmacists whose interests it represents."

C. W. PARSONS,
F. A. THOMPSON,
Delegates.

Mr. Brown made a motion, which prevailed, that a committee be appointed to consider the suggestions in Mr. Parsons' report and report at a subsequent meeting, and the President appointed as such committee Messrs. McFarland, Pauly and Prall.

Mr. Prall—Mr. President, it was the intention of the pharmacists of Saginaw to invite the association to an entertainment at the Academy of Music this evening, but unfortunately there is none. We would therefore like to have this session on Wednesday morning moved forward to this evening, so that we may devote the whole of to-morrow morning to the entertainment of the association.

Mr. Vernor made a motion to this effect, which was carried.

The Secretary submitted several applications for membership, and on motion the secretary was directed to cast the ballot of the association, and the following were duly elected:

Frank E. Bogart,
Edwin Ballard,
Fred R. Fuller,
Wm. T. Hennes,
Abram D. Lohnsbury,
F. H. Van Boemble,
Arthur Veitch,
Frank A. Tepoorten,
H. J. Scott,
Joseph Stafford,
James W. Stiner,
R. W. Selleck,
Wm. H. Vaughan.
J. O. Schlotterbeck,
Chas. W. Parsons,
Edward McCollough,
Jno. H. Hubert,
Geo. G. DeForest,
Aaron Cornell,
Lyman W. Bliss,
David H. Burley,
Chas. Dorman,
Henry Eifbrandt,
L. E. Reynolds,
E. E. Russell.

The Secretary read the following telegram, dated Harrisville, Michigan: "To the Michigan State Pharmaceutical Association: The lonely Alcona County druggist sends greetings and regrets. B. F. Buchanan."

The committee on New Members announced themselves ready to report, and the following report was submitted through Mr. D. O. Haynes, (Detroit) the Chairman.

REPORT OF SPECIAL COMMITTEE ON NEW MEMBERS.

MR. PRESIDENT AND GENTLEMEN—We present herewith the names of 65 applicants for membership in our association, together with check for $142.00 in payment of their initiation fees, first year's dues, and certificates.

We cannot say that we are pleased with the results of our efforts, at the same time we have made some progress. A request was made of each member to send us one new applicant, but the responses were not so liberal as expected. The Wholesale Druggists of Detroit expressed their interest in the association by offering a cash prize of $25.00 to the traveling agent securing the largest number of new members. The Pharmaceutical Era added a second prize of $10.00. The first prize was won by Mr. A. R. Thayer, who represents Messrs. Williams, Sheley & Brooks, and Mr. Chas. P. Nash, who represents the firm of Messrs. T. H. Hinchman

& Sons, is entitled to the second prize. Mr. Thayer sent in 21 applications, and Mr. Nash eleven. Mr. A. E. Gregg deserves honorable mention, having secured seven applications.

From the several reports received, it seems to be the almost universal reply from druggists who are not members of the association that they fail to see the practical value to themselves of becoming members. It does seem reasonable that every registered pharmacist in Michigan could secure some benefit to himself by attending these meetings, extending his list of acquaintances among men who are following the same line of work as himself, and enjoying a pleasant holiday, to say nothing of the valuable points regarding his business he might gather from the reading and discussion of papers, and from conversation with his brother druggists. Unfortunately, they do not all see it in this light, and the question for your consideration is—what can be done to arouse their interest in the association?

Your committee wishes to express their thanks to the wholesale druggists of Detroit, to their representatives, and to many members of the association for their valued assistance. Respectfully submitted for the Committee,

D. O. HAYNES, Chairman.

The report was received with the thanks of the association to Mr. Haynes, to the wholesale druggists of Detroit, and to the *Pharmaceutical Era.*

Secretary Brown then presented the following 65 applications for membership, obtained by the efforts of the committee, and they were duly elected:

Walter R. McMillan,
Geo. T. Jack,
Walter C. Snyder,
Carrie B. Kentz,
Henry Jacobs, Jr.,
Edwin T. Boden,
Shelley B. Jones,
Oliver C. Boynton,
Orin A. Faunckboner,
Sterry A. Johnson,
Chas. H. Merriam,
Edward O. Stafford,
Jonathan A. Zahn,
Alanson S. Brooks,
Martin Benedict Millspaugh,
Homer H. Packard,
Edward C. Nutt,
Marion Holland,
G. W. Dunond.
Edward H. Cress,
Harvey W. Smith, M. D.,
Charles E. Pettit,
Geo. C. Tappan,
Adolph Cohoe,
Chas. S. Berridge,
E. J. Haines,
Wm. J. Smythe,
Archie T. Miller,
Albert A. Foster,
Edward Wallace Gallagher,
Clarence D. Kirby,
V. C. Van Liew,
Lee M. Hutchins,
Duane Spalsburg,
Frank E. Jones,
C. F. Braden,
Jno. R. Bailey,
Harry Dolsen,
Chas. F. Kremer,
A. R. Thayer,
Jno. L. Barrister,
Jos. L. LaCroix,
Geo. S. Leyerer,
R. J. Spofford,
O. W. Roeser,
M. A. Graybill,
C. A. Wilson,
John C. Dullam,
S. B. Clark,
C. H. Craft.

Fred E Langenman,
Albert E Towlinson,
Leander Simoneau,
Theo. W. Myers,
George C. Beebe,
Chas. H. Frantz,
A. J. Buckham,
Frank Dullam,
S. M. Holton,
Bishop Humeston,
Louis Wolff,
E. J. Weeks,
L. G. Moore,
R. F. Simoneau,
W. H. Curtis.

Mr. Vernor stated that the committee on legislation had no report to make.

PRESIDENT: The next business in order is the reading of papers and discussions. Is there anything ready to be presented?

PROF. PRESCOTT: Under the order of papers and essays presented to the association, I beg leave to report from the Committee on Queries and Papers a little item of work which has been done. It is known very well to the members of this association that ever since its organization quite a number of the papers presented have dealt with the subject of the revision of the Pharmacopœia They have dealt with pharmacopeal descriptions or requirements and tests and standards of purity and strength, and a very large share of these contributions have thus been presented with a desire to make them serviceable in the revision of the Pharmacopœia which is now forthcoming. I have not made any enumeration of the proportion of papers and contributions presented to this association which might properly be credited as for the revision of the Pharmacopœia, but I should presume at least seventy five per cent of them could be so classed. They have, of course, been published in the proceedings of this association, and have then been republished in various periodicals and journals of pharmacy in this and other states. A few of them have been voluminous with tabular matter, matter serviceable rather for reference than reading, which is somewhat expansive for the journals to fully compass, and a few of the more valuable of them have been but imperfectly produced. Of course, we desire now that some summary of these papers, some catalogue of them, may be prepared for the information of the Committee on Revision, so that they shall actually come in play for that for which they are designe l The School of Pharmacy of the University has been very closely related to this work, so that it has become rather difficult to undertake to separate its work from that of the state association, and certainly no one in the School of Pharmacy would desire any such separation, so the Committee on Papers and Queries have taken the liberty to make such list for reference in the revision of the Pharmacopœia, which we have had printed, and I herewith produce. These contributions bear date from 1883 to 1890 and the index covers about twelve pages. The prefatory remarks relating thereto I take the liberty of reading. [See Supplement.]

PROF. PRESCOTT: The thought of this index arose so late in connection with this meeting that I did not have time to consult with all the members of the Committee on Papers and Queries, so I have taken the liberty of presenting it as a contribution of my own and of having a number of them struck off, and I will pass them around. If this index is to be presented, as its purport is, to the Committee on Revision, I think it proper that action should be taken by the vote of the association to that effect. Such action might be taken now, or perhaps, more properly after the index has been examined.

PRESIDENT: We will leave it until a later time.

Prof. Prescott then read a paper by Mr. F. A. Thompson, Detroit, entitled, "An Assay of Conium, Seed and Leaves, etc."

The chemical and medicinal properties of the alkaloid Coniine are too well known to the medical and pharmaceutical professions for further comment, while information regarding the percentage of this exceedingly poisonous active principle as found in the drugs and galencial preparations, is badly needed, and to this end the writer wishes to present his brief work on the several assays of crude drugs and fluid extracts as found on the market.

Preparations of Conium seed and leaves figure an important part in our Materia Medica, and it is necessary that knowledge as to their relative therapeutic value be made known, as well as impressed upon the minds of the two professions, and it is hoped that every addition will stimulate further investigations until we, as pharmacists, will be in a position to inform the practicing physician whose brand of fluid extract or other galencial preparation is most reliable and therefore the best.

The process of assaying, adopted for this drug, is a modification of Lyons' as given in his Manual of Assaying, and considered superior to any other in point of accuracy and simplicity, viz: Place 10 grammes of the drug in No. 80 powder, in a suitable (tall prescription) bottle, capacity 120 c. c. or 4 fluidounces, pour on 95 c. c. of petroleum benzin, shake, add 5 c. c. of a mixture of absolute alcohol 19 volumes, and concentrated ammonia 1 volume, cork and shake frequently (during working hours) for 24 hours. After this maceration decant and filter off (using a covered funnel) sufficient to obtain 80 c. c. of percolate, which is transferred to a separator containing 2 or 3 c. c. of water, and to this is added sufficient adilute (1:10) sulphuric acid to render the aqueous fluid acid, after vigorous shaking. After complete separation of the two fluids, the aqueous portion is drawn off into a two-ounce prescription vial having a good lip. The benzin solution is repeatedly (two or three times) washed with 1 c. c. of 0.5% HCl water and the washing added to the original aqueous fluid. In some cases it is necessary to pass the acidulated solution through a very small filter, previous to adding to the vial. Add to the mixed aqueous fluids, about 50 c. c. of petroleum benzin, shake and remove after complete separation. Again add about 90 c. c. of fresh benzin and sufficient potassium carbonate to render the fluid distinctly alkaline, and agitate well. After complete separation of the fluids, decant the benzin into a second two-ounce prescription vial containing 5 c. c. of 0.5% hydrochloric acid, and shake vigorously. Unless about an hour is allowed to complete separation, it is best to first transfer the benzin to an intervening bottle containing 2 or 3 c. c. of water, to remove adhering alkali. After again allowing the fluids to separate, return the benzin to bottle No. 1 and treat as before, repeating the operation three or four times, or until complete removal of the alkaloid to the acidulated solution. If clear, otherwise filter, transfer the acidulated solution to a tared capsule, evaporate to dryness on steam bath, and dry the salt at a temperature not above 90° C. for an hour.

and weigh as coniine muriate. The weight of the salt obtained, multiplied by 0.77675 gives the quantity of coniine alkaloid in 8. grammes, or if multiplied by 9.7094, gives the percentage of coniine.

After weighing the coniine muriate, titrate with semi-deci-normal silver nitrate solution as a check on the weight, each c. c. of the silver solution being equivalent to 0.008675 c. m. of coniine muriate or 0,006738 gammes of coniine.

The average of the succeeding fifteen assays, representing eight different samples of the drug, is 0.494% coniine; therefore a standard requirement of 0.50% coniine, estimated by weight, for the drug as well as the fluid extract, would seem a fair and just one for our next Pharmacopœia.

ASSAYS OF CONIUM FRUIT.

No.	I. Coniine Muriate in 8 Grammes of Drug.	II. Per cent. coniine calculated from I.	III. Semi N-10 $AgNO_3$ Solution for I.	IV. Per cent. coniine based on III.
1	0.069 Gm.	0.38	4.6 C.c.	0.39
	0.041 "	0.40	5. "	0.42
2	0.059 Gm.	0.57	7.2 C.c.	0.60
	0.064 "	0.62	7.6 "	0.64
3	0.044 Gm.	0.42	5.2 C.c.	6.44
	0.042 Gm.	0.41	5.1 C.c.	0.43
4	0.052 Gm.	0.51	6.3 C.c.	0.53
	0.049 Gm.	0.48	6. "	0.50
5	0.052 Gm.	0.50	6. C.c.	0.50
	0.050 Gm.	0.48	6. "	0.50
6	6.58 Gm.	0.56	7. C.c.	0.59
	.....	.....	.....	.....
7	0.054 Gm.	0.52	6.5 C.c.	0.54
	0.056 Gm.	0.54	6.6 "	0.56
8	0.053 Gm.	0.51	6.3 C.c.	0.53
	0.066 Gm.	0.51	7.9 "	0.53

FLUID EXTRACT CONIUM SEED.

Assaying of the drug only gives one the basis of a standard for the fluid extract, as well as the market value, and not of the Galencial preparations made from it; therefore more importance must be attached to this assay of the fluid extract, tincture, etc., than to the drug.

Although fluid extract and tincture of conium seeds, and not the leaves, are recognized by the U. S. Pharmacopœia, it is a fact that much larger quantities of the latter preparation are dispensed. This, however, does not lessen the importance

FLUID EXTRACTS OF CONIUM SEED.

No.	I. Per cent. of extractive dried at 100°C.	II. Coniine muriate in 10 C. c.	III. Semi N-10 $AgNO_3$ required for II.	IV. Per cent. of coniine calculated from II.	V. Per cent. of coniine calculated from III.	VI. Value based on 0.50 per cent coniine as a standard.	Physical properties.
1	13.7	0.064 Gramme. 0.068 "	7.7 C. c. 7.6 "	0.50 0.52	0.52 0.51	100 per cent. 104 "	Light brown and distinctly acid.
2	8.8	0.066 Gramme. 0.062 "	8. C. c. 7.7 "	0.51 0.48	0.54 0.52	102 per cent. 96 "	Light brown and distinctly acid.
3	9.6	0.057 Gramme. 0.058 "	7. C. c. 7. "	0.44 0.45	0.47 0.47	88 per cent. 90 "	Dark brown and freely acid.
4	15.8 Including glycerin	0.044 Gramme. 0.044 "	5.8 C. c. 5.85 "	0.33 0.33	0.35 0.36	66 per cent. 66 "	Greenish brown and freely acid.
5	9.8	0.044 Gramme. 0.041 "	5.2 C. c. 5. "	0.33 0.32	0.35 0.34	66 per cent. 64 "	Reddish brownand distinctly acid.
6	7.7	0.040 Gramme. 0.037 "	5. C. c. 4.7 "	0.31 0.29	0.33 0.32	62 per cent. 58 "	Light brown and distinctly acid.

of knowing the value of the preparations made from the seeds, especially the fluid extract as found in the open market.

The general process used, and found adapted to the assay of the different samples, made with varying alcoholic menstrua, is as follows:

Place 10 c. c. of the fluid extract in a small evaporating capsule, add 5 c. c. of 0.5% hydrochloric acid, if fluid is not already slightly acid, and digest on a water bath till free from alcohol. Cool, transfer fluid to a two-ounce prescription vial, add 20 c. c. of petroleum benzin, shake well, and, when separated, remove the benzin; repeating this washing until the benzin takes up little or no coloring matter. Now add about 20 c. c. of benzin, and sufficient potassium carbonate to render the fluid distinctly alkaline, and shake vigorously. After complete separation, decant the benzin into a second two-ounce prescription vial, containing 5 c. c. of 0.5% hydrochloric acid, and shake well. After separation, return the benzin to the first bottle, and repeat the operation until the coniine is completely removed to the acid fluid. Three or four times is usually sufficient. Remove the acidulated solution, which should be perfectly clear (otherwise filter through a very small filter) to a small tared porcelain capsule, and evaporate to dryness on a water bath, finally drying the coniine muriate one hour at a temperature not above 90° C.; cool, and weigh. Multiply the result by 7.7675, which gives the percentage of coniine in the fluid extract.

This process is applicable to the U. S. P. tincture, using 50 c. c., and proceeding as with the fluid extract, after reducing it to a small volume on the water bath.

From the foregoing table it is readily seen that three of the samples are up to an average quality, with others, two-thirds and nearly one-half the strength. The physical properties of these samples did not differ more than fluid extracts made at different times by the same process, proving that the appearance of a fluid extract is no guide of its value. This is also true of the crude drug, a fact which is ever borne in mind by the large manufacturers of reliable fluid extracts, and should also be by every pharmacist who makes his own fluid extracts, tinctures, etc.

CONIUM LEAVES.

According to Hanbury and Fluckiger's Pharmacographia, page 301, conium leaves (*Conium maculatum*, L.) contain, though in exceedingly small proportion, the same alkaloids as the fruits. Geiger obtained from the fresh herb, not so much as 1-10000 part of coniine. The same observer, as well as Pereira, has pointed out that conium leaves when dried are very frequently almost devoid of coniine, and the observation is supported by the more recent experiments of Harley.

These observations agree with all literature that I have ever read, and with my own experience in the examination of this drug, which covers several years, but even in view of this fact, I find on the market a fluid extract of conium leaves, assayed and wrapped with a printed circular on Assayed Fluid Extracts, which under the head of conium leaves the following claim appears:

Galencial preparations of this drug and of the seeds are notoriously unreliable; an alkaloidal standard for this drug is therefore a marked advance. Our fluid extract contains 0.50% coniine, estimated by weighing the muriate, which is to be preferred over any method of titration.

It may be of interest to the reader to learn that upon procuring two samples of this brand of fluid extract of conium leaves, that both were found to contain mere traces of *coniine*, discernible only to the olfactory nerves, after the addition of an alkali, and heat. Such facts are to be regretted, as one example like this does shame to the commendable subject of assayed Galencial preparations. It is surprising to learn that a large manufacturing house would throw such a reflec-

tion on their own work, in the way of assaying fluid extracts, by publishing such absurd results or claims. It is hoped, however, that such will be speedily corrected and the truth made known, *i. e.*, that the most carefully prepared fluid extract of conium leaves cannot contain any appreciable amount of coniine, as the drug originally does not.

In conclusion, it may not be out of place to suggest a fair requirement for the U. S. P. tincture and alcoholic extract of conium seed (fruit), viz: That 50 c. c. assayed by the same process as applied to the fluid extract, shall contain 0.045 gramme of coniine muriate by weight, equivalent to 0.035 gramme of coniine, and that 2. grammes of the latter shall contain 0.064 gramme of coniine muriate by weight, equivalent to 0.050 gramme of coniine or 2.5%.

Laboratory Parke, Davis & Co., Detroit, August, 1890.

On motion the paper was accepted with thanks and ordered printed in the proceedings.

A paper by Mr. C. A. Martzloff, of the School of Pharmacy of the University of Michigan, was then read, under the title "Adulteration of Lard with Cotton Seed Oil." This paper is published in full in the *Pharmaceutical Era*, Vol. 4, page 418, Nov., 1890. The writer treats of the means of detecting the adulteration (1) by the appearance of the article, (2) by the specific gravity, (3) by the melting point, (4) by solubility in petroleum benzine (Dr. T. Taylor), (5) by various proposed chemical tests. The nitrate of silver test was subjected to systematic trial, and is recommended for the pharmacopœia.

The discussion which followed was participated in by Prof. Prescott, Mr. Vernor, and others, and brought out the facts that lard adulteration is very general, and that in addition to liquid cotton seed oil, cotton seed oil stearin is largely employed. This stearin is the solid fat obtained by chilling cotton seed oil and pressing out the liquid portion at a low temperature.

Mr. J. O. Schlotterbeck then read a paper prepared by Mr. Ihlhardt, of the School of Pharmacy, entitled "Malt Extract. Methods for the Estimation of its Diastatic Power."

The therapeutic and nutritive value of malt extract depends in large part upon its power of converting starch into sugar. This is known as the diastatic power, being due to the presence of a vegetable ferment called diastase. The products of the action of diastase upon starch are maltose and dextrin; and dextrin is further, by simple hydration, converted into maltose. The proportion of these products varies with the temperature employed; according to O'Sullivan, at any temperature below 63° C. we find in the filtered solution; maltose and dextrin in the proportion of 67.85 to 32.15; at a temperature between 64° and 68°-70° the nitrate contains 34.54 maltose and 65.46 dextrin; and between 68°-70°, and the point where the activity of diastase is destroyed, about 17.4 maltose and 82.6 dextrin. Inasmuch as the diastase cannot be separated for weight without large loss, it is estimated by finding the quantity of starch it can convert, an operation of dynamic assay.

The chief methods hitherto reported upon may be cited, for comparison, as follows: (1) DUNSTAN and DIMMOCK'S method, 1879: *Phar. Jour. Trans.* [3] 9, 733; *Proc. Am. Phar. Assoc.*, 27, 544. (2) T. S. DIMOND'S method, 1884: *Phar. Jour. Trans.* [3] 15, 236. (3) HAGER'S method, 1881: *Archiv. der Phar.*, 16, 297. (4) JUNGK'S method, 1883: *Am. Jour. Phar.*, 55, 289; the same, 1885: 57, 13. (5) R. A.

CRIPP'S method, 1889: *Phar. Jour. Trans.* [3] 20, 481. (6) J. R. DUGGAN'S method, 1886: *Am. Jour. Phar.*, 58, 9. (7) A. B. PRESCOTT'S method, 1885: *Am. Jour. Phar.* 57, 126. (8) LINTNER'S method, 1886: *Jour. prakt. Chem.*, 142, 389. (9) A. P. SMITH'S method, 1889: *Chemist and Druggist*, June, p. 873; *Am. Jour. Phar.*, 61, 432. (10) CHITTENDEN AND CRISWOLD'S method, 1881: *Am Chem. Jour.*, 3, 305. This list of authorities on a way of finding diastatic power is by no means complete.

Of the nine methods just cited, those numbered (1), (3), (7) hold fixed conditions of time, temperature, concentration, etc., for the conversion, and undertage to find how many parts of starch are converted by one part of malt extract under these conditions specified. Numbers (2), (4), (5) fix upon quantities of starch in ratio to malt, as well as upon concentration and temperature, and undertake to find what time is needful for the complete extinction of the starch. And (6), (8), (9) are operations to find how many parts of sugar are produced from one part of starch—the time, temperature and concentration being stipulated. Among conditions influential, beside concentration, time and temperature, in the action of the diastase on the starch, are also the quantity of the iodine, the time for its action, and the shade of color adopted as indicating extinction of the starch. Also, in methods calling for estimation of the sugar, the manner of this estimation and whether in presence of other reducing agents or not, is of importance.

The greater number of the methods propose a valuation of diastatic strength, in terms of quantity or of time, but methods (3) and (8) propose only certain test limits, below which the result calls for the rejection of the article. The most of the methods are accompanied with some conclusions as to what requirement ought to be made in respect to starch converting power.

The writer has made trial of the conversion of starch by malt extract under the various conditions given in the several methods above cited, except those methods in which the sugar is estimated. Indeed some work was done with the last named processes, but satisfactory conclusions were not reached.

In Lintner's procedure no account is taken of the sugar already contained in the extract of malt, so that the estimation of sugar reaches an empirical result. Both Duggan and Smith first estimated the sugar already in the extract, then allow it to act upon an excess of starch, and determine the total sugar, from which the first estimate is deducted. Duggan uses a starch mucilage of three per cent. strength; Smith directs that it have a specific gravity of 1.020. The former employs a half hour digestion; the latter, four hours.

To mark the extinction of the starch, as in all the methods not estimating the maltose by Fehling's solution, iodine is invariably used. The reaction of diastase on starch is more distinct at higher temperature, as conversion is more rapid, Under the method of Jungk, and that of Cripp, the diastase reaction was found not complete in 10 or 12 minutes, but it took from 5 to 10 minutes longer for faint coloration to disappear, and sometimes 16 or 18 minutes were expended. It has been stated by Baswitz* that the time for this reaction is constant if carbonic acid be excluded, but not constant in ordinary atmosphere. The present writer found the variations not so great when the conversion was made in a flask, as when a beaker was used. The directions of Jungk in respect to the end reaction by iodine were found satisfactory. By using an excess of iodine, as he does, constant results were obtained, and by dilution the color is easily read.

University of Michigan, June, 1890.

Taking this paper as a test, Mr. Bassett asked why such papers, of scientific import only, should be incorporated in the proceedings thus putting the association to so much expense. He failed to see its practical value to the working pharmacists. He offered this mild protest for the sake of eliciting information and draw forth a discussion.

*M. BASWITZ, 1878: Zur Kentniss der Diastase, *Ber. d. chem. Gasell*, 11, 1448.

Messrs. Haynes, Pauly, Parsons, Eberbach and others were averse to omitting any of the papers, on the contrary thought every inducement should be offered to members and others to prepare contributions.

Prof. Prescott, chairman of the Committee on Papers and Queries, said the committee have always considered it a part of their duty to accept the papers offered. It is not a very common thing that papers have to be rejected, and still but a small share of the papers that might be obtained by this committee are actually offered. A portion of them are read, either by title or in abstract, and a still smaller proportion are published in the proceedings. The experience of this association and others has been that very few queries are accepted. The larger number of papers are volunteer papers. Very few of the state associations publish many papers. The Michigan State Pharmaceutical Association has published more papers every year in their proceedings than are published by any other association, partly in full and partly in abstract, and have probably published two or three times as many as are published on an average by other associations. I agree with Mr. Bassett in the statement that the diastatic power of the extract of malt is not the sole criterion of its value, and I should dissent from the paper if it is so stated in the paper clearly and decisively. I have been in the habit of saying upon the subject of the extracts of malt that their value lay in two directions or was important in two particulars. In one particular as food, and in the second particular as a digestive agent. Malt extracts have some value as foods. Foods have a very limited place in the materia medica, a very limited place in the Pharmacopœia, but we do have some articles in the drug trade that are defined by the Pharmacopœia, and that are properly foods. A digestive agent is very emphatically a remedial agent. It is medicinal in a proper sense, and inasmuch as the diastatic power, the digestive value of the extract is the value most difficult to obtain and preserve, and which is the highest quality of manufacturing skill—I should say that in my judgment the diastatic value is the most important feature in the value of any extract of malt. Furthermore, if an extract of malt be so prepared as to have a fair amount of diastatic value it must, perforce, have food value. If the diastase is preserved intact in making and keeping, the food value cannot have been injured.

MR. BASSETT: I am very sorry indeed to have this discussion come up before such a small attendance, and I most sincerely desire to have it understood that I have no fault to find with this paper, with the author of the paper, or with what he is supposed to have accomplished by the paper, but I know I voice the sentiments of a very large proportion of the retail druggists of the state of Michigan, and I think I voice the sentiments of a large percentage of the membership of this association, when I take the ground that our proceedings must, if we grow and prove useful, take a more practical turn than they have heretofore, and that is the point I wish to make in bringing up this matter for discussion upon this

paper. I simply start the ball rolling upon this paper because I think it a very good time to do so.

If this association desires to have papers of various natures presented to it and to spend their money publishing everything that is brought in here, then I have nothing to say, but if we wish, as a body of practical business men, to give a large share of our attention to the practical questions that arise in our business, then we must not give too much of our attention to things of this nature. I hope that Prof. Prescott and the author of the paper will not have any idea that I have anything against the paper, or anything against any paper, but I desire to see this association take practical steps to some practical end in regard to our business.

Mr. Haynes desired to say a word upon this matter. "These papers are largely produced by graduates of the University, and they have in view to a certain extent the enhancing of their own reputation. It is no more than right they should. The paper is published in these proceedings and it is published all over the country, and to them it is a decided advantage, if it is a good paper, and I think the association can well afford to publish the papers. It helps the association, as well as the authors. I understand the author of the paper is not a member of this association. I think that every person who presents a paper ought to be a member, and I presume if Dr. Prescott would call his attention to it he would join. But with regard to Mr. Bassett's remarks, I hope that the subject will come up at a full meeting. I have not very much to say on the subject, but I want to say something, and I know there are many others who wish to say something. Is the association going to live or die? I wish it might be noised around that this matter is coming up tonight and I wish that every member interested would make it a point to be here."

PROF. PRESCOTT: Regarding the papers that originated in the School of Pharmacy of the State of Michigan, I should say that the writers of these papers, the men who have done the experimental work and investigation which is reported in these papers, never had any voice especially in their presentation to this association. I wish to speak very frankly and very clearly on that point. The officers of the School of Pharmacy, considering it is a state school, have looked upon it as a servant and ally of this association, and they have by careful conference with each other, going over all of the reports of the work done in the school, selected such papers as seemed to them most worthy of publication during most of the years since this association was organized. The cream of these papers has come to this association. Some of them have gone to the American Pharmaceutical Association, so that the school has been remonstrated with by the officers of the A. P. A. because of their having given them to this association, which they claimed belonged to the American Association. Some of my friends in the American Association have said the proceedings of the A. P. A. are more widely circulated

over the world, and such has been the nature of that remonstrance during the last two or three years, that there have been more papers given to the A. P. A than were given previously; still the larger number come to this association. The editors of the Pharmaceutical Journals solicit our papers from the first, and would be very glad to get them before the meeting of this association.

Now, in offering them to this association the School of Pharmacy offers them as a school. Every paper so offered is dated at the School of Pharmacy, and it is a contribution which lies between the individual author and the school; both are responsible for it to some extent. The requirement as to membership which has been suggested of those presenting papers has not been insisted upon. Of course that can be insisted upon if it is thought best. There is no objection in it, at least I have none. I spoke very emphatically myself a year ago in this association regarding the space in the proceedings to be taken up by these reports and papers. I invited remarks upon that subject. I proposed that that space be reduced. There was then remonstrance against reducing the space. At the same time the Committee on Pharmacy and Queries consulted with the secretary as to the desired expenditure in printing the proceedings, and the space was reduced to a considerable extent, largely by supplying abstracts of papers rather than print them in full.

Now, let me end as I began, with entire frankness, and meaning just what I say. It is the desire of the School of Pharmacy as a state institution to be as serviceable to this association as it can. It has no other interest in presenting these papers, and I beg of you don't print any more than you want, and if there are any friends of the school here let me say it is not necessary for the interests of the school that they should be published; at any rate it is not for the interests of the school that they are offered.

MR. PRALL: With these other gentlemen I regret that this subject has come up for discussion while we have a small number in attendance. We cannot insist upon papers going into the subject of trade interests alone. Both these subjects assert themselves in our profession and combine with the business, and I should like to see both branches, if I may so refer to them, of our association assert themselves. I think means could be found to raise funds to publish all papers that we could get, all that we could find time to have read at our meeting, and I think if the right course were pursued we could also develop the matters pertaining to trade. People who are most interested in trade matters do not give us papers enough.

I have observed two sides to this question in clerks that I have had in my employ. Clerks who are excellent salesmen are sometimes of little service in the prescription department, and I have had those who were excellent students and poor salesmen, and I would like to make the business grow so that I could employ both and invest in each department, and it seems to me in our association we can afford both kinds of papers.

MR. PARSONS: For a number of years past the Pharmaceutical Association of Michigan has held the destinction of being the best in the country, and it has gained that destinction from the fact that it has had the best papers. Its proceedings have been the most valuable, with perhaps the possible exception of the A. P. A., of all the pharmaceutical associations, and much of this value has been given by the publication of these papers. Certainly the association is not made any the worse by having all the science you can get into it. The trouble is we have not paid enough attention to trade matters. It is not necessary to lessen the scientific interest in order to promote the trade matters. If there are any trade subjects to be brought up they will receive attention. The trouble has not been with the persons who presented these papers, but from a lack of effort on the part of those interested in trade interests. I should regret very much to see these papers thrown out, and I should on the other hand like to see a much fuller discussion of trade subjects.

MR VERNOR: I think the thanks of this association are due to Mr. Bassett for bringing up this subject as he has. I think we all agree with Mr. Bassett that the more papers of this kind we can get the better, as well as all the expressions we can get on trade interests. I do not think Mr. Bassett will feel at all hurt if the papers are published in full.

MR. BROWN: These paper are written by young men in their senior year in college. They are their thesis papers. Many of them do not stay in Michigan, they go to other states, and to require these men simply because the officers of the school see fit to present their papers to the association—which is a favor to the association, I do not think would be the proper thing. Indirectly of course it brings the author of the paper before the world, but it would seem to me manifestly unjust that he should be required to join this association, unless he locates in Michigan.

The issue of the discussion was that this matter be left to the Editor of the Proceedings to use his discretion in the matter of publishing the papers, whether they be given in full or in abstract.

The meeting then adjourned till evening.

EVENING SESSION.

President Inglis called the meeting to order, at 8:30 o'clock, and introduced Mr. F. M. Heath, president of the Ohio Pharmaceutical Association, who spoke of the cordial relations existing between the associations of Ohio and Michigan, and made special mention of the fact that he believed the Ohio pharmacy law preferable to that of Michigan in that the former gave pharmacists three years' lease of life, instead of one.

This session being intended to be devoted to trade matters, the secre-

tary, in the absence of its chairman, H. G. Colman, read the report of the Committee on Trade Interests, as follows:

To the Members of the Michigan State Pharmaceutical Association:

GENTLEMEN—Your Committee on Trade Interests is unable to report anything accomplished during the past year. As there has been no session of the Legislature nothing in that direction has needed our attention.

The most that we can do at this time is to bring before the association several questions relative to trade interests, for your consideration. These have occurred to the members of the committee, or have been suggested to them by other members of the association as pertinent subjects in this convention.

1st. How to treat the growing tendency among physicians to buy their supplies away from home to the neglect of their home druggists.

2nd. How to treat articles, proprietary goods, soaps, perfumes, &c., which are sold at "fairs," variety stores, &c., at cut prices.

3rd. It often occurs that a druggist in one part of the state has certain articles for which he has little or no demand. He would be glad to dispose of them at a reduced price. At the same time another druggist in another part of the state has a demand for those same articles and would be glad to obtain them at a reduced price. For the purpose of bringing two such druggists together Mr. D. O. Haynes, of the Pharmaceutical Era, has suggested that a bureau or sort of intelligence office might be established by the association and that by extending its advantages to members of the association only, it might be made to help in increasing our membership. It occurs to us that in this connection an arrangement might also be made for bringing together druggists wanting clerks and clerks wanting positions. Mr. Haynes has kindly consented to give you the details of the plan which he has in mind.

4th. Frequently in cases of sickness or injury the druggist is called upon to trust out medicines to persons who, he feels sure, will never pay him. Any other kind of a merchant would refuse to trust the person, but the druggist feels that as a mere matter of humanity he must let them have the medicine. Can anything be done to protect the druggist in such cases, by helping him to get his pay? Trusting that a discussion of these, and of other subjects which may be suggested, may be profitable to the association and hoping that our successors on this committee may be able to accomplish more for the association than we have done your committee most respectfully submits this report.

H. G. COLMAN,
L. PAULY,
E. J. ROGERS,
Committee on Trade Interests.

On motion the report was taken up for discussion, section by section leaving the first section, however, for later consideration.

Mr. Haynes believed the matter dealt with in section two to be very important, and hoped it would draw out many expressions of opinion. He mentioned the action of the Minnesota associations, and would ask Mr. Parsons to give at length the results achieved.

Mr. Parsons said: The Ramsay County, Minnesota, and the Minneapolis Association combined, some time since sent out joint letters to proprietors, manufacturers, wholesale dealers, and also to all pharmaceutical associations throughout the country whose addresses were known to them. Most of you have seen those circulars, and your president has given you a brief outline of their contents. Since the issuance of these

circulars the secretaries of the two associations have received many communications from various parts of the country, from various branches of trade, notably from the wholesale dealers, and they have issued a second series of circulars, placing the matter of regulation of prices in a little more detailed shape, and now submit it to the different associations for their action. The meat of the circulars is contained in a pledge of honor which they submit to the various manufacturers, wholesale agents, jobbers, etc., which reads as follows:

PLEDGE OF HONOR.

To be signed by all Manufacturers of and all Dealers in Patent or Proprietary Medicines in the United States, both Wholesale and Retail.

I hereby pledge my word and honor to the Association of Manufacturers and Dealers in Proprietary Articles of the United States, and to the National Wholesale Druggists's Association as follows:

1st. That I will not sell any of the so-called Patent or Proprietary Medicines for less than the regular established retail prices of such articles to any person or persons whomsoever other than regular dealers in such articles, excepting only in such cases where six or more bottles, boxes, vials, pots or other packages are sold at one time; and that I will not sell, excepting to regular dealers in such articles, six or more bottles, boxes, vials, pots or other packages of such medicines at one time for less than at the rate of six such packages for the regular established retail price of five such packages; or twelve such packages for the regular established retail price of ten such packages.

2nd. That I will not sell any of such medicines to any dealer in such articles for less than the regular established wholesale price of such articles.

3rd. That I will not sell any of such medicines to any dealer in such articles other than the owners of regular wholesale or retail, or wholesale and retail drug stores, except in towns where there are no druggists or where the druggists refuse to handle the goods of any particular manufacturer, in which latter case the goods which the druggist so refuses to handle may be sold in such towns to other dealers.

4th. That I will not sell any of such medicines to any person or persons to me known to be selling in violation of any provision of this pledge, no matter whether such person has signed this pledge or not.

5th. That I will not sell any of such medicines to any person or persons reported to me by the proper officers of the Association of Manufacturers and Dealers in Proprietary Articles of the United States as selling in violation of any provision of this pledge until the matter has been adjusted with such person to the satisfaction of such officers and I have been notified of the fact.

6th. That I will not give away, either directly or indirectly, as premiums or otherwise, any of such goods for the purpose of advertising or inducing persons to buy other goods.

7th. That I will carry out in good faith all the provisions of this pledge and will not connive with any person or persons, either directly or indirectly, to violate any part of it or permit or suffer any one in my confidence or employ, either directly or indirectly, to violate the same.

City or Town..... .. ....

....

Date..... ....

NOTE.—The name of every person found selling proprietary medicines in violation of the conditions of this pledge should at once be sent to the Secretary of the Association of Manufacturers and Dealers in Proprietary Articles of the United States, who will immediately send notice of that fact to every Manufacturer and Jobber of Proprietary medicines in the United States, giving the name and address of the person so selling, and instruct them to not sell such person any more proprietary medicines of any kind until he desists from such cutting, arranges the matter to the satisfaction of the committee and binds himself under penalty to not do so again.

We believe that if this plan is adopted and carried out in good faith and a proper effort made by the Manufacturers and Jobbers to enforce it that it will effectually put a stop in this country to all cutting of prices on patent medicines. We believe that the plan will meet with the hearty approval of the Wholesale and Retail Druggists throughout the country, and that but few of them would attempt to violate their pledge of honor. If any should violate it they could easily be whipped into line by cutting off their supply. Manufacturers and Jobbers should not hesitate for a moment to refuse to fill orders from any person found selling contrary to the provisions of this pledge as there would be dealers enough left to supply the trade.

The Wholesale and Retail Druggists and the local Pharmaceutical Associations in the various localities would be vigilant in sending notice of any cutting.

In addition to this we respectfully suggest that it would be a good plan for the Association of Manufacturers to employ permanently one or more special agents whose business it should be to ferret out and investigate all cases of cutting and report them to the proper officers of that organization. And that whenever any one is found selling contrary to the provisions of this pledge notice of that fact should at once be sent to every Manufacturer of and every Wholesale Dealer in Proprietary Medicines in the United States, giving the name and address of the cutter and notifying them to not sell him any patent medicines of any kind until he desists from such cutting, arranges the matter to the satisfaction of the committee and binds himself under forfeiture to not commit a like offense.

A catalogue should be issued by the Association of Manufacturers showing the retail prices of all patent medicines sold in the United States for general distribution among the Pharmacists and Wholesale Druggists throughout the country.

We believe that the expense of putting in force and maintaining this plan should be borne by the Association of Manufacturers, and we think that we are sufficiently well acquainted with them to form the belief that they will cheerfully bear all expense of any feasible plan to put a stop to the cutting of prices on their goods; many of them have promised this and some of them have offered to put in five thousand dollars and increase it if necessary. No such sums will be required from any individual firm. The expense will be trifling to each individual member if borne by the entire association.

We do not intend this plan in any way to interfere with the rebate system now in force with the Manufacturers and Jobbers. We believe that system to be a good thing and we hope that you will allow it to stand.

We understand that the National Wholesale Druggists' Association and the Association of Manufacturers and Dealers in Proprietary Medicines both meet this year in Washington, D. C., on Sept. 29th to Oct. 3rd.

Perhaps you will be able through the combined wisdom represented in your organizations to improve on our plan. If you do not think that the plan we have presented is feasible then we respectfully request that you extend to all retail dealers in the United States the rebate plan now in force between the Manufacturers of Proprietary Medicines and the Wholesale Druggists of this country, with such modifications as may be necessary, but do not fail to give us something and *something good.*

If the rebate plan is extended to the retailers it will be necessary to send with every invoice to them, whether from the Manufacturers or Jobbers, a rebate check showing all the items of proprietary medicines contained in the invoice and the amount of rebate on each item, but this would be no serious objection. We are unable to see why the rebate plan, with slight modification, will not work as well with the retailers as it does with the wholesalers.

We believe, gentlemen, that you can stop the cutting of prices on patent medicines if you will take hold of it with the determination of doing so. It may cost something, but the benefits to be derived warrant the outlay.

We earnestly request that you take some vigorous action at your next annual meeting to effectually put a stop to the gross injustice and grievance referred to.

Very respectfully,

EDWARD SHUMPIK, Secretary,
Minneapolis Pharmaceutical Association.
Address Minneapolis, Minn.

S. R. McMASTER, Secretary,
Ramsey County Pharmaceutical Association.
Address St. Paul, Minn.

This pledge has been called to the notice of proprietors, and their signatures thereto requested."

Mr. Parsons further said that the Minnesota Pharmaceutical Association had adopted resolutions endorsing the plan of the local associations, and then read a stenographic report of the proceedings of the Commercial Section of the A. P. A. (recently in session at Old Point Comfort, Va.,) showing the action taken by that organization. (This action has been fully related in the current pharmaceutical journals.)

Mr. James E. Davis said that he had been appointed to represent the N. W. D. A. before the Michigan association, and, while presenting cordial and friendly greetings, would urge that a delegate be selected to attend the meeting of wholesalers at Washington. Many other states had been represented at the meetings of the N. W. D. A., Michigan never, except by some wholesaler.

Prof. Prescott corrected the speaker, and said a delegate did once attend, the association paying his expenses.

A little desultory discussion followed.

MR. VERNOR then said: I am glad to see that there is an association that is still meeting and resolving and appointing delegates on this question. If that ever ceases we will be entirely without hope. As it stands now we are in the same position we were formerly. As I understood it, the second question that we were to discuss was with reference to the sale of toilet articles by bazaars and fairs. I don't know how it is with other people, but it would seem to me the question of selling toilet articles has become a question of the survival of the fittest. As far as we are concerned, we endeavor to avoid selling cut goods entirely. We push them to one side. If we are obliged to keep them, we keep them hid. If we are obliged to sell them we sell them at a cut price, but if we can possibly sell anything equal to them, upon which we can make some margin of profit, we do so. I think this is the only solution of the ques-

tion. As long as cutting obtains in any neighborhood we have to meet it. It is all very well for us to meet here and say we will do this and we will do that, but we have to meet the cut. I would like to see some plan that would stop it, but I haven't seen it yet. I hope if any gentleman present has a plan it will be brought to the front. On the way out here I heard Mr. Davis express himself very forcibly upon this question, and I should be glad to have him repeat his remarks.

MR. DAVIS: I believe this is a meeting of retail druggists. I do not think the wholesale druggists ought to be brought into this thing at all. I can only say this for ourselves: that anything which you retail druggists want us to do will be done. I believe the jobbers have always stated that anything upon which the retail dealers would unite, we would carry out. The great trouble in the past has been that there have been certain black sheep which we could not control. I believe we tried to control a number of them in Detroit, but it was hard work. I think, however, that to a certain extent Mr. Vernor has struck the key note in more ways than one when he speaks of the survival of the fittest. As our cities grow in size there will be more druggists and there will be more cutting. The greater the number of people who go into business, the harder it is to control them I understand there are about thirty-two thousand retailers in the United States, and in order to have this thing a success you would have to make every one of them agree to it. I don't think it can be done. I have heard wholesalers say that if any plan could be formulated they would abide by it. This thing was attempted once before and it was found that some jobbers, after being cut off under the Campion plan, were being supplied by retailers. It was very hard to control it. In the wholesale business we have the rebate plan and it has worked well, with the exception of one or two houses. One, especially, has been able to secure all the goods he could sell at cut prices, and although detectives have been put upon the track, we have not been able to find where he gets the goods, and he still bothers the trade. It is impossible to tell where he gets them. They come in five and ten gross lots. Yet the retailers themselves will help him in doing this very thing. I know one thing, the jobbers are willing to do everything in their power to assist the retailers to stop this cutting of prices.

MR. VERNOR: We have had considerable trouble in Detroit, as you are aware, and the wholesalers have come to the front nobly. They have done everything they could in the way of suppressing the cut rate store. We have adopted a plan there of opening a store in opposition; that is, we have allowed the store next to the cut rate store to sell at prices equal to or lower than the cut rate store. He keeps great cards out in front of his store, advertising the fact. How it works I am not prepared to say, as I have not been in the city much lately. Do you know, Mr. Davis?

MR. DAVIS: No, sir. I have asked a number of retailers and they

have all stated to me that they have been compelled to meet those prices, or lose their customers. I have asked them if they thought it would be a success and a number of them said they didn't think it would be, as there would be cutting all over the city and it could not be stopped. It is questionable in my mind as to whether it will succeed, and I think I so expressed myself at the meeting, but they decided to open it. While this man is cutting, the other fellow is still on deck and he is still cutting. I was talking with one of our neighboring wholesalers when in Toledo the other day. He said, "Do you know so and so in Detroit?" I said yes. "Is he a cutter?" "Yes." He said: "I was a little suspicious of that. He ordered a gross of Cuticura Resolvent and some other things of us and we asked him why he didn't buy them in Detroit and he said he couldn't, and, he said, we refused to sell him, but he says he bought them, I think, in Toledo of our competitor here." This goes to show that they will cut these goods and they will get them, and the harder you fight a man sometimes the harder he will fight in return. You gentlemen must understand there are a large number of retail druggists in Detroit, and if they cannot buy in Detroit, they will in Toledo, Kansas City, or wherever else they can get them. It is a thing that is very hard to control unless you combine all over the United States—retailers, jobbers, manufacturers, all together. Unless you do that this thing cannot be stopped.

Mr. BASSETT: I do not believe there can be any plan formulated to stop the cutting of prices; or, in other words, I don't believe, to boil it right down to a fine question, that there is any cutting of prices. That may seem somewhat paradoxical, but I think I have given this matter some little attention, and I have come to the conclusion that toilet goods and proprietary goods are worth just what they will bring, and if I sell them I have got to sell them as cheap as anybody else, or else I must not sell them. I think Mr. Vernor's solution of the question is a very good one for him. He says he don't keep them, but if he does he hides them; does not sell them unless he is obliged to. That is a very happy condition for a business man to be in if he don't want to sell a thing, and can throw it aside. I am not in that position. I have to sell my goods to get bread and butter. I have to display them in order to sell them. I have to sell them as cheap as anybody else, or I don't sell them at all.

I do not believe all the wisdom in the United States concentrated into one committee can formulate a plan that will bind, not only the thirty thousand druggists in the United States, but the one hundred and fifty in the city of Detroit. We may be an ornery lot there, but you could not get any two of us to think alike. We will have a meeting, for instance, and there will be ten or twelve at the meeting, and there will be ten or twelve of different opinions. We talk it over. Some of us express our opinions very forcibly, and the result is that we go away in exactly the same condition that we came. Every man goes back and does business as he had a mind to.

The business of selling drugs, or the running of what we designate a drug store, has assumed, in my opinion, a two-fold aspect. One side of it is the professional side, as our graduates claim. They do their business according to certain rules laid down in colleges and pharmaceutical schools, and they won't overstep those bounds. Now, if a man wants to run that kind of drug store he is all right, if he can get his neighbors to think he knows a little more about compounding a prescription than anybody else; if he can he can charge more than any one else and they will pay it willingly. But a man who goes into the market as a tradesman, as well as a pharmacist, if he handles things handled in drug stores, must buy and sell them according to the rules of trade; buy as cheap as he can and sell them for all he can get, and he can't get any more than his neighbor does. We have settled down to the fact that we are going to buy as cheap as we can and if we can get a gross of goods ten percent. cheaper in one place than we can in another, we are going to do it. We are going to buy as cheap as we can and we are going to sell—well, I don't know that I ought to give it away, but there are only two or three ladies here, and they never give anything away—we are going to sell for all we can get. If we can get a dollar for Ayer's Hair Vigor we are not going to sell it for less, but if we have to sell it for ninety cents we will do it. If the customer can get it somewhere else for eighty cents, we are not going to let him go out without it. We have men standing around our store and we want that twenty cents and if we can get enough of those twenty cent pieces to run our store we are going to do it. I did not endorse the Campion plan, and there are a great many old members of this association who will remember that I didn't believe in it. I do not believe in any plan that attempts to bind the consciences of men against their will, or attempt to control their business against their will. You can't get any dozen men in the state of Michigan or in any other state who will stand by it and if you undertake to bind them it will not hold. The rebate plan touches the jobbers. They get along with it pretty well. I don't believe more than-three quarters of them break the rebate plan, possibly the other quarter live up to it; but I will tell you, gentlemen, and you know it is a fact, that as long as I have got money to buy goods I can buy them, and you can make all the Campion plans, or any other plan, and I can buy goods as long as I have money to pay for them, because there is always somebody who wants to sell. I have attended every meeting of this association, with the exception of the first one, and I have studied nights and Sundays to devise a plan that would relieve some of the friction that is connected with the drug business and I am now in a very receptive mood. I am ready to receive anything under the sun that is going to advance my interests as a retail druggist; whereby I can make something out of it. That is what I am in business for, and if any gentleman in this association, or in the A. P. A., or in the Wholesale Druggists' Association, or any doctor, or minister, or layman will devise a plan that will allow me to conduct my business honestly and make

more money out of it than I am making now, he is the man I want to meet.

MR. DAVIS: I want to put myself on record as objecting to what Mr. Bassett has said in regard to the wholesale druggists breaking the rebate plan. I don't think there are over two that have broken it; the rest are sticking to it honestly, I believe, in every particular. I would like to state that I think Mr. Bassett takes a wrong position. I think we should all go on record here that we want retail prices to stand, and that some resolution should be passed by this association and forwarded to headquarters, or whatever you may call it, so that they may know that we are on record in Michigan, that we want the retail prices of all proprietary articles kept up to the regular price, and if any plan can be devised we will adopt it, provided it comes in a strong way. If we go on record strongly before the proprietary and wholesale druggists it may carry a good deal of weight, it may be the means of adopting some plan. I believe a plan can be adopted. It may take time. It may take a year, but the way we are going on now means ruination to many retail dealers. We want them to make more money and in this way there will be as many patent medicines sold and at better prices.

MR. BASSETT: I trust that no member of the association will misunderstand my position. I see a good deal in the papers nowadays about people making gifts or doing certain things and having a string attached to it. I certainly hope this convention will adopt a resolution of that kind. I will vote for it, and the very minute a plan of that kind is adopted which will meet the endorsement of all manufacturers and all retailers we will carry it out.

MR. PRALL: I have heard the druggists of Grand Rapids had difficulty in the matter of competition with the cutters, and that they formed an organization which has been running nicely for several years, and they have done away with the cutting. In Saginaw we have never had any trouble of that sort, so we cannot speak from experience.

PRESIDENT: There is such an organization in Grand Rapids. They had a good deal of cutting and I understand they have none now. I think Cleveland is the largest city that has escaped cutting in prices. Even the bazaars that sell these goods sell them at the regular prices.

MR. CALDWELL: When you get at the actual facts in Grand Rapids I understand you can get goods at cut prices, the same as in Detroit. As to the cutting of prices in large cities, I think the only way to fight a cutter is to cut. Fight the devil with fire. I think we make a mistake in Detroit if we don't all cut—cut boldly.

MR. HAYNES: I think it is fortunate that the druggists of the country are not all alike. I have heard of several places where they have devised a plan which has worked successfully to stop cutting. I have heard of one place in the south where they had a severe tussle with it for over a year. They finally found, after a time, that they were all glad enough

to resume regular rates. Cleveland, as has been stated, is the typical large city where there is no cutting. While Mr. Bassett is in business to make money, he is perfectly willing to branch out in the direction to take all his own profits and his neighbors' away. With that spirit he cannot stop cutting and I do not think Detroit druggists will stop cutting until they all lose money, and then perhaps they will stop.

MR. BASSETT: I hardly think it is fair to say that I am doing this. It is forced upon me. I don't sell a man anything for less than a good price, if I can help it.

MR. WARD: It seems to me that if cutting is a good thing the more we have the better, and if bad the less we have the better. I have always taken the position that if anybody else wanted to sell goods at less than cost I was perfectly willing they should do so, but I would not. I do not think the patent medicine trade is one that we should cultivate, but a thing that druggists should discourage, and devote their energies to the building up of a prescription trade, thus making profitable prices on other lines of goods, as, for instance, druggists' sundries and physicians' supplies and our own preparations. We should cultivate our relations with physicians and encourage the prescription trade, and we would do a great deal better than by exerting our energies in cutting prices.

MR. DULLAM: We got together in our town and agreed on prices for all patent medicines and it worked like a charm. The proper thing is to get your retail druggists together, hold conventions and maintain prices, and if you don't do so it will be cut and slash. I have had customers come into the store and say they could buy such preparations as Warner's, say, for $1.10, and they would go into the next store and say they could buy at our store for $1.00, and before they got through going the rounds they would say they could buy it for 90 cents. We got that thing all arranged and made the prices and to-day we don't have any bother about cutting. If a man comes in and says he can buy a bottle of a certain thing at one price at a certain store, we follow the man in. We go in and read what we call the riot act, and we get full prices, and we don't have any too much trade at that.

Referring to prescriptions, I will say that I look upon the matter in this way: I like to compound a prescription as well as anybody, but I will tell you if you put up a prescription and charge a man a proper price for it, it is dollars to apples that he won't take it, or that he will object to the price, and if he does take it it will be a wonder if the physician don't get into the cigar case, or something else of that kind, and take off the profit. A bottle of patent medicine at a good full price I will guarantee will give you as much profit as any prescription you can put up.

MR. DAVIS: This is a very important matter. As a wholesaler, I can say from my own experience that there is a profit in patent medicines if they are sold at retail. You take the amount of proprietary articles in the United States that is sold, whether at cut prices or at full prices, and

there is an enormous profit to the wholesale druggists throughout the country. I do not think this association can do more than pass a resolution. If the cutting cannot be regulated in Detroit and Grand Rapids I do not see how this association can stop it in any way, but I do think a well drawn resolution, putting this association on record, would be of advantage, and if the proprietary and national associations can formulate a plan with the retailers so that all can work together, it would be for the advantage of all.

MR. EBERBACH: It has been said this evening that the only probable plan of success would be to have the support of all the wholesalers and of all the retail druggists. Everybody can see that is a practical impossibility and the result of it will be that it will not amount to anything. I do not see that there is any prospect of solving that question in a satisfactory manner. Mr. Bassett hit the point when he said there were two aspects to pharmacy, one of them a professional one, and the other trade. The professional one can be regulated by some code of ethics, but when it comes to trade interests, it is a matter of trade qualifications. Everyone is not qualified to deal with trade matters. Some will be successful, while others will make a failure. I think if druggists generally would give more attention to the preparation of household remedies with good formulæ and put them up in their stores in a tasteful form they can succeed in preparing a set of remedies that they can control and in that way build up a trade

The secretary was directed to send to the N. W. D. A. a copy of the resolution, which was placed in writing and unanimously adopted, as follows:

Resolved, That the Michigan State Pharmaceutical Association deplores exceedingly the practice of cutting prices on patent medicines by retail druggists and others, and in order to stop the same they will support any good plan that can be devised by the National Wholesale Druggists' Association, the Proprietors' Association, or the National Retail Druggists' Association, which will do away with this unfortunate state of affairs.

Mr. H. G. Colman now instituted consideration of the first section of the report, viz: How best to treat the disposition that exists in some places among physicians to buy their supplies away from home.

He said: I do not know that this evil exists everywhere. I presume those who come from larger cities are not annoyed as we are in smaller towns. In Kalamazoo it is a somewhat serious matter and I learn that it exists in many other places. I have been trying to conceive of some way to overcome this difficulty. The question is a hard one to solve. Of course it goes without saying that these supply houses have a perfect right to exist and have a perfect right to solicit the trade of physicians. It also goes without saying that physicians have the right to buy their supplies wherever they please. They need not ask our permission and still, all things being equal, the proper thing in any town is to patronize home institutions. We should be obliged to hold a physician's trade the

same as we hold anybody's else, and we cannot do it by force. We must do it by showing them it is for their interest to patronize their own home druggists. I think the first thing to be done is to find out the cause. There may be more than one cause, but the principal one is a matter of dollars and cents. Physicians in a good many towns have taken to prescribing their own medicine, and the reason they give, as far as I know, is that it is better for them. They say that their patrons, especially those in the country, do not like to pay the charge of the physician and the expense of a druggist's prescription also. They also say that they must compete with the homeopath, and I suspect that most of them dispense their own medicines because they think it is better for them to do so. I presume the reason why they send away for their medicines is the saving in the majority of cases. Whether it is so or not, they think they save money by doing so. The traveling man from a supply house comes to Kalamazoo, for instance; he goes to the physician and he says: "I can save you some money. I can furnish you such a thing at such a price." The physician believes it. He does not come to us to find out whether this is true or not, and we do not go to him to inform him whether it is true, and the result is that the traveling man has it pretty much his own way. Finally some day or other when we happen to meet a physician we say: "We can furnish you such and such a thing at a certain price," and he is surprised.

One of the first things for us to do in this connection is to look after our trade and the fault lies there that we do not do it. A physician may come into our store and we suggest perhaps one thing or another, but as for really going after him and instructing him that we have what he wants, just as good as he can get in the city, and that if he wants something unusual we can get it for him as cheap as anyone else, we permit him to go away, and in that way we lose his trade. The main fault is that we do not look after physicians' trade. I know the margin is not very large, yet after all I believe there is something in it for us.

Another thing which I think it should be proper to call the attention of the physician to is the quality of goods we sell. It is a fact that most of these supply houses pick up their goods here and there and everywhere, and the pharmaceutical preparations which they furnish to physicians, fluid extracts and other extracts, in a great majority of cases are something which they have made themselves, or have bought pretty cheap. You will observe, too, that the instruments which they sell, as a rule, have no trade marks of any reliable manufacturer and usually their own or nobody's name. I think it is true that the majority of druggists' stores are stocked with reliable goods, with instruments of established reputation. When a physician comes to our stores to get something that is reliable he is sure he is going to get it and he is not certain of it if he gets it from a supply house. I think if a physician has the matter put to him in that way, if he is a physician who really cares for the quality of his goods, he is very sure to see the point.

As I have already said, there is a tendency on the part of physicians to send away for their goods on the mere ground of dollars and cents, but there are cases in which the physician has taken a prejudice against the druggist and the druggist against the physician. Perhaps the reason is that the physician gets out of patience because he thinks the medicines are not what they ought to be. I have had physicians say: "I don't know as I care very much about patronizing you fellows. You think more of patent medicines and traveling quacks than you do of a physician, anyway." I submit that feeling does exist sometimes and perhaps there is some ground for it. Sometimes the druggist takes a good deal of interest in pushing patent medicines and does it in a very noticable sort of way, and if he does that and has his name attached to the patent medicines, he can hardly expect to retain the patronage of many physicians. Then, too, it may happen that a traveling physician comes to town and he stands in with the druggist. That physician sends in his prescriptions and when people ask the druggist what he thinks of that physician he says he is a wonderful physician and will refer him to the wonderful cures that he has made. Now, if druggists do that sort of thing they cannot expect to retain the regular physicians' trade. Of course, all druggists do not do this, but frequently the whole profession is blamed for what a few do.

If I were going to discuss the patent medicine business I would suggest as a profession we do not gain anything by taking too much interest in attempting to push patent medicines. If we have something of our own which we have compounded, it is perfectly proper for us to push it, if we can do so without interfering with physicians' prescriptions, and yet I doubt whether we derive enough more benefit from it to make it worth our while. I am inclined to think it may work against us in the estimation of physicians.

I think the solution of this whole question is to look more after the physicians, paying more attention to their trade. I presume if only one man in a town attempted to do this it would not amount to anything, but if all druggists throughout the state looked after the matter we would find that the physicians' trade would not be given to supply houses and it would not be worth their while to send a man over the road to look after that trade.

Another thought has occurred to me, although it may not be practicable. The physicians in some towns prescribe certain things like White Pine Compound, or some such thing. Now, I doubt whether, as a rule, that if the druggist would put up a preparation of that same kind and go to the physician and try to get him to buy it, he would succeed very much in doing it. But if we had a line of such preparations put up by one of our own number, according to formulæ which were endorsed by this association, and we should all of us all over the state push those compounds to the front and if we had an arrangement by which we could

sell them to the physicians as cheap as he could buy them anywhere else, we might gain a point.

MR. DAVIS: Let me add a word to Mr. Colman's remarks. A matter which came up the other day brings up one of these points very forcibly, and that was the necessity of the retail druggists cultivating the physicians' acquaintance. One of the most prominent physicians in Detroit stated to me that none of the druggists who were near his office, and there were several within two or three blocks, had ever called upon him. The matter was brought up by reason of his wanting to know if he could buy his goods of jobbers. I told him he could not, that he must obtain his supplies of retailers. I asked him why he wanted to buy of a jobber. He said: "If I come into your wholesale houses, or if one of your agents is sent out, they always call our attention to new things. I know as a matter of fact that the druggists near me are certainly receiving new articles into their stores, and I, for one, should like to have the retail trade call on me and make my acquaintance and show me the new goods they are getting in, and in that way I think I could buy more goods of the retail dealers." I think the point was very well taken and that the retail dealers neglect to cultivate the physicians' acquaintance. They send them blanks, but they do not call upon them to show them their goods.

The president here called upon Dr. Bliss, president of the Michigan State Medical Society, for a few remarks.

DR. BLISS: How best to keep the physicians' trade is a question that perhaps I am not sufficiently conversant with to be able to advise you. I am a physician, my partner is not. He keeps me and I keep him. As to the trade of outside physicians we pay very little attention. We treat them as we treat our customers. We have no premium on prescriptions or anything of the kind. If prescriptions come to us we put them up in the manner in which we think is right and which pleases them and as their patients profit by it they become satisfied and everything goes along. We never have been in the habit of giving physicians any rebate. I think the idea of keeping a physician by giving them a bonus is all wrong. I do not believe in this bickering at all. I think the upright way is the right way. If another man wants to cut goods, very well, but I will sell my goods at a profit and if I can't I will keep them upon my shelves.

MR. PAULY: In our section of the country physicians do not handle medicine very much. We have but one in our town who does. They have come to the pharmacists once in a while to have a prescription compounded. I remember of his sending to me and I refused point blank and he went to the other three druggists in town and they gave him the same answer. They all have trouble when it comes to some fine work, and unless the prescription is properly compounded the patient won't stand it. The thing cures itself because they have not the prepara-

tions and if they have they can't put them up and the result is that if there is a pharmacist in town that can put them up the patients will come to him.

PRESIDENT: The third question is on the subject of credits, which will be accepted by Mr. Pauly.

The following paper by Mr. L. Pauly, "How to Prevent Losses in the Retail Drug Business," was then read:

Retail dealers in any commodity must of necessity be occasional losers by customers failing to settle their accounts, but I believe that the druggist is proportionately a heavier loser than any other dealer. The cause of this is attributable to various circumstances, a few of which I wish to present, and would ask the society to suggest remedies if practicable.

The largest number of losses come from families who are self-supporting in health, but who, by the sickness of the provider, lose their support and become involved in debt. Having been cash customers before, it is almost impossible to refuse them credit for necessaries, and as sickness progresses, the demand on the druggist becomes heavier, food preparations and wines, etc., being added to the bill for prescriptions. The patient may recover, of course he does in the majority of cases, and he may thank the apothecary who provided the means to regain his health, but who, as a matter of fact, is about the last who gets paid. He has to have a roof over the heads of his generally numerous family, and the landlord pushes for his rent, and he pays it. The hungry mouths have to be fed, his grocer will not furnish provisions, nor the butcher meat unless the bills contracted during the sickness are settled, and he pays them; but lucky for him, there being no sickness now in his family, he does not require any drugs or medicines, and the druggist having no means to enforce payment, either loses the amount of his bill entirely or has to wait for the convenience of debtor. Should, however, the customer die or remain ill the whole amount of the bill is generally lost. The family is too poor to pay, and if the poor authorities are approached, they will tell you that they have not authorized the issuing of the supplies. And right here is a point I wish to make. Any vagabond, tramp or outlaw, who has no respect for himself at all, and whom sickness overtakes in his wanderings, can go to our city, village or township poor boards and get medical treatment, but let a hard-working mechanic or laborer be taken ill, a man who has too much pride to become a public burden, as long as he is able to earn a living for himself and family, and the poor boards know nothing about him; bills contracted by him are referred from one official to another, until the druggist gets disgusted and drops his claim. And now let a druggist after such experience refuse to furnish medicines to such an applicant, he will be decried by the people as an unfeeling wretch, who refuses the means of alleviating suffering to a dying fellow citizen.

Other losses are met by furnishing medicines, dressings, etc., to employees of corporations, manufacturing firms, etc. These cases are mostly accidents, and it would of course be impossible to inquire, when such happen, who will pay for the material furnished, and in the large majority of cases it turns out that the man has no means, is probably indebted to his employers, who in turn refuse settlement, as they claim that the man was injured through his own carelessness.

I have in mind two cases of the kind that happened to me quite lately. One was an accident to an employee of a lumbering concern. The man fell between some moving logs, fractured both legs and received other serious injuries. He was promptly attended to and no questions asked as to who would settle the bills. After a few days the company gave it to be understood that it would not be responsible for any expense incurred in the treatment of this man, and while the surgeon kept on attending the man, the druggist continued furnishing medicines,

the boarding house keeper promptly informed the sick man's friends that he must be paid or the man taken to the poor house. The money was raised for his board among his friends; but when the doctor went to the poor board for his and his druggist's expenses, he was promptly informed that the man was not a resident and not entitled to the local benefits unless he would go to the poor house. As this place is 16 miles out of town and he was not in a condition to be transported there, his medical treatment had to be credited to the charity of his physician and druggist.

The other was a railroad accident. A train of empty cars was being moved from the ore dock to the yard, a distance of about a mile. Nearing the end of its route, a misplaced switch caused it to run into a lumber train. Of the men on the train, four were injured, two so much as to require medical attendance. Telephones rang, messengers ran, an engine was sent into town for the local railroad physician, who quickly dispatched it back to the drug store for chloroform, sponges, bandages, etc., etc. The men were removed to their boarding house and attended until they fully recovered. At the end of the month the bill for surgical material and dressings was forwarded to the headquarters of the company, duly certified by the local surgeon and agent. In a few days the bill was returned with the indorsement, that the druggist would have to look to the men for his payment, as neither of them were on duty at the time they met with the accident, the men simply using the train to go from their work to the boarding house. When receiving this note, I wondered if the railroad company would charge them fare for this trip. It surely would not be surprising.

And our national government even takes a hand in defrauding the druggist out of his dues; not satisfied in making him pay a $25 liquor tax for using alcohol and its products for medicinal or mechanical purposes, it withholds moneys earned by him by attending to the sick who are entitled to the government's care. I refer to Marine hospital cases. As many of you are probably aware, the government levied for a long number of years a monthly tax of forty cents on every sailor, of whatever rank, for hospital dues, in consequence of which he was entitled to treatment in case of sickness or injury. A number of Marine hospitals are kept up for this purpose, and in cases where it was not possible or advisable to move the patients to one of the hospitals, the bill for his attendance and medicines was paid by the hospital authorities. Of late this tax has been discontinued, but the hospital service and attendance still continue, but the collection of any bills from this branch of the government is a matter of such difficulty, that druggists in our section of the country are rather careful how they allow sailors to run bills for medicines.

A good many of you have doubtless read of the murderous assault of some members of a traveling Uncle Tom's Cabin Company on the captain of the transfer steamer "St. Ignace." The manager of this vagrant company tried to intimidate the captain and insisted on his troupe being ferried across the Straits before the time arranged for; the captain refused and tried to quiet the fellow, who on being refused commenced a row and threatened the captain. Witnesses differ somewhat as to who struck the first blow, but the consequence was, that the captain suffered from a broken arm, caused by a blow from a club, and that the mate was struck over the head; these two being the only ones in the room with the gang of actors. The mate was knocked insensible and remained in a precarious condition for several days, requiring steady medical attendance and quite a few prescriptions. The assailant was arrested, brought before a justice, who held him for trial before the circuit court, with bail of a thousand dollars. He furnished the bail, depositing a thousand dollars in cash in the bank, but failed to appear before the court, thus forfeiting his money and acknowledging his guilt. After the recovery of both patients, the bills for attendance and medicines were furnished to the local deputy collector of customs, who approved them and forwarded them to proper authorities. I forgot to mention that the captain had paid

hospital dues for over forty years, and the mate for seven, and that neither ever had required any treatment during all these years. After a long wait the bills were returned disallowed, the authorities claiming that the captain might have avoided the collision, and that the doctor and druggist would have to look to them for payment. Now, suppose the captain was to blame, a supposition not borne out by the fact that the other party forfeited his thousand hard dollars, was the mate to blame for saving the captain's life? As a matter of principle, both the captain and mate have appealed from the decision of the collector, but so far have not been able to get a decision of any kind. Both would have settled their bills personally, but for the fact that such bills, if once paid by the men themselves, are never known to be allowed to them. I have a customer here now, a marine engineer, who paid me his account seven years ago, and has not been repaid yet. I believe that he has expended the amount of the original bill in postage, stationery and affidavits by this time.

After an experience of a good many years, I am still at a loss to meet cases of which the above are a few illustrations. It is of course nice to parade as a public benefactor, but I have my doubts if we will get credit above for enforced acts of charity, and I am free to confess that a large majority of accounts that I have to charge to charity, have been so charged under pressure of circumstances over which I have no control.

On motion the association adjourned until the following afternoon at two o'clock.

SEPTEMBER 17, 2 P. M.

President Inglis announced the first business to be the discussion of the third section of the report of the Committee on Trade Interests.

Mr. Haynes said that the disposal of surplus and dead stocks was a question which should be referred to the Committee on Trade Interests to take such action as they deem advisable. He would suggest that the secretary might keep a list of these articles, publish it once a month, and distribute it to the members of the association. It might be well also to establish a bureau through which clerks and employers could communicate one with another.

Mr. Vernor objected to placing this work upon the secretary. The Board of Pharmacy has on record the names of clerks seeking situations, and supplies these names to employers wishing them. He thought it might be a good plan to open a department in the *Pharmaceutical Era* for advertising surplus stocks.

Mr. Haynes showed that Mr. Vernor's latter suggestion was not feasible, and a proposition made by Mr. Bassett that the association make a contract with the *Era* for advertising space for this purpose was not favored. It was shown that the necessary expense to carry out such a plan would not be warranted by the importance of the question, and that

when tried it had proved a failure. After desultory discussion the whole matter was referred to the Committee on Trade Interests.

Mr. H. G Colman read the following paper on "How to Fit Trusses:"

Were any one of us to talk with a dozen different druggists on the subject of truss-fitting and selling, we should probably find their opinions about equally divided regarding it. Some would say that they like it, that they find it an interesting, in the main a pleasant, and a fairly profitable branch of their business; others would pronounce it a nuisance, more bother than it is worth. This difference of verdict may be due somewhat to the differences in the druggists in matters of taste and in mechanical skill, but I think it is due principally to the different modes of conducting the business. The first requisite to successful truss-fitting is to have a clear conception of what a hernia is. To be able to recognize the various forms of rupture and to know in each case, in just what direction to apply pressure in order to reduce the hernia, and also to hold it most securely and at the same time most comfortably to the patient. There are published various anatomical charts which illustrate the subject. A person may gain a very good knowledge of it by studying Gray's Anatomy. In their catalogue for 1889, I. B. Seeley & Co. give a chapter on hernia, illustrated to some extent, which is well worth reading. Not least important is that part of the chapter which treats on "Affections often Mistaken for Hernia," and also the other part of the chapter which discusses "Symptoms of Hernia often Mistaken for those of other Affections."

(Here the writer gave a verbal account of a case wherein a third testicle was mistaken for a hernia, and a truss was fitted, causing much pain before discovery of the trouble. Also an account of a young man whose testicles had been prevented from ever descending, by wearing a truss, although of late he has not had and probably never had a hernia.)

The second requisite to successful truss-fitting is a good out-fit. No man can do good work without a good place to work in and a good assortment of good tools to work with. Under the head of out-fits I would place first of all a suitable room, where one is retired, not subject to interruptions, where things are neat and clean, comfortably warm, and where trusses and tools are or can be arranged conveniently at hand. One works at a decided disadvantage when he takes his customer behind the prescription case, or down cellar, or into a back room among barrels and boxes, subject to constant interruptions and where it is so cold that the patient in his exposed condition soon becomes uncomfortable and impatient.

Next in order comes a good assortment of trusses. By good assortment I don't mean that one should try to keep some of every kind and style that are made, and buy every new fangled, double-geared contraption that comes along. He should select a few good styles, which by experience he knows that he can do good work with, and then have *a full assortment of sizes* of these kinds. As to what is the best truss to keep, good judges would no doubt give different opinions. One thing is certainly true, that no one truss is the best truss for all cases. Were a new man in the business just putting in a new stock to ask me to advise him in making a selection, I should say to him, get a few elastic belt trusses, a few soft kid finished, light spring, French pattern, including infant sizes, and then get the greater part of your stock in hard rubber covered trusses. Of the different styles of hard rubber trusses, I would select the ones shown in Seeley's Catalogue as Figures 3, 5, and 6, ("Hood's"). I think very highly of the Hood pattern; it seems to me to obtain the lifting pressure resembling that which one exerts when holding a rupture on himself by his fingers on the same side, the nearest of any truss that I have ever used. The "Crossbody" style worked well in the few cases of femoral hernia which I have ever had. For inguinal hernia I do not consider it as good as the other styles mentioned. The best way to store trusses is in boxes,

with a cut showing the style of truss which each box contains pasted on the outside of the box, and the sizes distinctly marked on it. The boxes should be arranged on shelves where the marks can be readily seen.

Next to the trusses themselves one should have a vise and a good pair of large pliers to be used in bending and twisting springs. A No. 8 vise is sufficiently large, screw driver, tape measure, alcohol stove for warming hard rubber trusses, matches, etc., should all be in their places. And the out-fit is not complete without a chair in which a patient can be gradually let down flat on his back and gradually be brought up again to a sitting position without any effort on his part. Such a chair is better than a couch, because when necessary to fit a truss to a person lying down, the straining required in his rising is apt to throw everything out of place. A cheap, surgeon's chair answers every purpose. In the absence of such a chair a couch is infinitely better than the floor or even some boxes.

With your room, your trusses, your vise, chair, etc., all in good shape, the next question is how to handle your patient? This is frequently a compound and a complex question. If I could do just as I would like with a patient, I should examine him, make up my mind what kind of a truss is best for his case, take a hard rubber one of that pattern, fit it to him, paying no attention to his suggestions, being sure to have it stiff enough to hold him, and then tell him to come in again after a few days. Then on his coming in if I thought I could weaken the spring so as to make it more comfortable for him and still keep his rupture secure, I would do so. That would be comparatively simple and easy work, but as a rule we can't do it in that way. The customer is apt to have ideas and whims, to ignore which will offend him and leave him dissatisfied, no matter how good work you may do on him; while to yield to which will insure poor results. A man who has worn a truss is apt to think that he understands the truss question and knows what he wants better than anyone else can tell him. And even a man who has never worn a truss is apt to have preconceived ideas which he is slow to relinquish. The question, then, how to handle your patient is a double one, not merely how to treat his rupture, but how to manage him. Or, as one truss-fitter expressed it, "how to fit his head as well as his rupture." I don't suppose that surgeons or eminent truss-fitters are troubled with this first question, but with the average druggist it is the most troublesome question in the whole truss-fitting business, and therefore we will now give it first attention.

When a man has worn a certain kind of truss and wants another just like it, if you happen to have that kind it is usually best to give it to him, and practically let him fit himself, even though you may know that it is not the best truss for his case. You might exhaust yourself persuading him to take the kind that you know to be best for him, but most likely you would do him no kindness. Ten chances to one he would bring it back to you after a few days pronouncing it a failure, and his poor opinion of your ability as a truss-fitter would be established for ever. Most men wear their trusses too low; they do not understand that the aperture is above the tumor. If you place the pad where it should be the first thing that they do is to shove it down out of place, it is the truss-fitter's duty to explain to them the anatomy of the parts and why the pressure should be placed higher than they suppose, and if possible "educate them up" to wearing the pad where it belongs.

In cases where the patients are not attached to a truss which they have been wearing, but still are disposed to follow their own ideas, make their own selection of a truss and dictate how they want it adjusted, I say to them pleasantly, "I think I know a great deal better than you do what your case requires. If you will permit me to select the truss and to fit it to you, and if you will wear it where I place it, I will guarantee that it will suit you, or I will take it back and refund the money to you." When a patient proposes to take one or more of my trusses home and try them, I say, "No, you may select your truss and fit it to yourself here, and if you desire I will assist you, but I take no chances on your truss-fitting. You must pay for the truss before you take it home, and after you take it home you

must keep it." After a little firm but kind talk of this sort, the patient will usually put himself in my hands. In talking that way to a patient I mean just what I say. I will not let any man take my trusses home and try them, if they don't fit he doesn't know how to make them fit, and he is almost sure to bring them back, soiled more or less. I have then had my trouble and the damage to my trusses all for nothing. I will take my chances on my own truss-fitting and the patient must take his chances on his. On this point it pays to be independent and positive.

In cases where a person is strenuous for a belt truss, either because he has been tortured by a poorly fitted spring truss, or for any other reason, if I think that a belt truss will serve him fairly well, I follow his preferences.

The best trusses for women—my experience on this point is limited. Two lady physicians have been in the habit of coming to me for trusses to fit their lady patients with, they have frequently described the cases to me and have asked my advise. From that experience I have formed the opinion that while a woman may face the music and have a tooth pulled with less ado than a man (and dentists tell us such is the case), when it comes to protracted discomfort they have less patience and endurance than a man; moreover they form opinions from the looks of a truss. If a truss looks to be hard and uncomfortable it will hurt her when she wears it, and if it looks nice, soft and comfortable, she will find it comfortable. Therefore for women I would select neat soft kid covered French patterns, with as light springs as possible.

So much on the management of a customer. We will now consider briefly the matter of *adjusting the truss*. Exactly how to adapt a truss to each individual it would be impossible for any one to explain without a clinic of a variety of cases, but certain general instructions may be given:

First. Insist on exposing the patient sufficiently to have a fair chance at him. Working under several layers of clothing, from undershirt to overcoat, and among a tangle of suspenders, *et cetera*, is too much like cutting a man's hair with his hat on. Take off coats, let down pants and pin shirts up out of the way. If the patient wishes to wear the truss over his under clothing he can do so, after you get it fitted, the thickness of the clothing will probably make no difference with the set of the truss, but fitting over a shirt is blind work. Have the patient stand up straight with his heels together and bearing his weight equally on both feet, reduce the hernia while in that position if it can be done easily. If that is not easily done, select the truss which you are to use, put your patient on the chair, reduce the hernia, hold it with your fingers while you bring him back on to his feet, then put on the truss and remove the fingers. In some very bad cases it may be impossible to remove the fingers, and adjust the pad without letting the rupture partially escape. In such cases put the truss on him, get the rear adjustment all right, then put him on his back, lift up each pad, reduce the rupture, put the pad in place, then carefully bring him on to his feet. Then sit down in front of him, have him cough and strain and change positions; if it escapes, watch and see just where it escapes. If it is possible, be sure to have the hernia completely reduced before the truss is put on. Sometimes in an old hernia certains growths or adhesions have taken place which render a complete reduction impossible. Whatever can be returned to the abdominal cavity without materially lifting the spermatic cord should be held there. Be sure to have the truss completely holding him before you let him go. A truss that is pinching an intestine which has partly, even in a small degree, slipped by it is a very uncomfortable and often a very harmful truss. For that reason it is better to have the spring too stiff rather than too weak. It is better to say to a patient, "I think this spring is stiffer than you will need it permanently, and after you have worn it a few days, if you will come in I will slack it up," than it is to say to him, "I want to make it as easy as possible for you, I will try a limber spring, if it doesn't hold you I will make it stiffer." If it fails to hold him he is liable to consider you a failure and to want to try some one else. So on the start, whatever else you do or fail to do, *be sure if possible to*

establish the fact that you can hold him. At this point I would emphasize again the importance of keeping a full assortment of sizes, it is too bad to fail of a perfect job just because you have to use a truss which is a size too large or too small.

Keep a record of every truss that you fit, it will be of service to you in many ways.

Rupture in infants. It is sometimes almost impossible to put onto the little fellows trusses which will be comfortable, or which will keep in place. I think that as a rule a spring truss is better than a compress, and that a soft leather covered French pattern is the best. A hard rubber truss would be cooler and more cleanly, but it is more apt to slide out of place. The following device has worked well in some light cases: Take two corn or bunion plasters, stick their gummed sides together and stick them onto a piece of adhesive strip. The plasters make a good compress with the hole in the middle, place the compress on the hernia and fasten it in place with the strip. This should be changed quite frequently, and each time the strip should be fastened to a new place. If more pressure is needed an additional bandage can be attached to the compress and passed around the body.

Sometimes a person coming to a druggist for a truss brings along his physician to superintend the matter. As a rule physicians are not practical truss-fitters. I have found that the most satisfactory way in such cases is to simply tender the physician the use of your room and your assortment of trusses and leave the case entirely in his hands. If he declines your tender, as most likely he will, he will be careful not to interfere with your work to make any suggestions that will embarrass you.

Mr. Vernor read the following paper, entitled, "Side Shows in the Drug Business and the Sale of Opiates:"

When directed by our president to say something under the title of "Trade Interests," I begged him to be more definite; all the satisfaction I received, however, was, "Oh, something that will cause discussion." I ran over the familiar list, counter prescribing, cut-rates, patents, non-secrets, shorter hours, Sunday opening, arrangement of the prescription counter, education of the shop boy, sales of liquors, postage stamps, soda water, cigars and express orders.

The various nickel-in-the-slot devices, the penny weighing scale, and the gum slot, the nickel chocolate, and the phonograph, the cutlery case, stationery, wall paper, jewelry caskets, playing cards, valentines, toys, fishing tackle, and Christmas cards, pass rapidly in review before me, and I could not but admit that the field, although rather well-worn, was amply large enough to satisfy anyone.

The thought came to me that the "side shows" were overshadowing the principal business in which we are supposed to be engaged, and the question arose before me, do we in our efforts to secure a competency, by the sale of articles that in reality are foreign to the business, injure the standing and respect that should be accorded to that business, in the eyes of the community?

Are we doing our duty to the people? are we giving the time, and thought, and study, to the business that the public have a right to expect? and I could not but realize, that in many instances such was not the case. There is but one way (which I desire to say I have learned by personal experience) in which such sales are warranted or can be conducted, with profit to the proprietor, and justice to the public, and that is, by always retaining a sufficient force of competent help, whose hands and minds are free to attend to the legitimate business of the pharmacy. I do not think that any business that may be conducted in a respectable place will, if brought into the pharmacy, injure it in the eyes of the public, unless it is given such undue prominence as to cause delay, inconvenience, or inattention, to those who come there for medicines. It makes no difference to the customer anxiously waiting for the remedies he needs to relieve the suffering of

those he loves, how many people are drinking soda water at the front of the store or how fast the nickels drop in the slot of the chocolate box, whether the party buying his pole and tackle intends catching bass, pickerel, or perch, or whether the lady trying to solve the problem of style and tone of paper and envelopes proposes using them for acceptances or regrets, so long as a faithful and competent pharmacist is giving *him* his undivided attention, but if you wish to see a man become nervous, anxious, and impatient, watch him in a store when a clerk is obliged to excuse himself for a few moments, to attend the soda counter, or to sell some of the (to him) frivolous articles mentioned. It will take but a short time to give him a very unfavorable impression of that pharmacy, and he must be a good friend indeed to the proprietor, if he does not transfer his future patronage to a pharmacy where more attention is paid to its legitimate work. Gentlemen, I may seem to be speaking strongly to you, but I beseech you upon no account to allow anything outside of the legitimate business of the pharmacy to interfere with that business. It will be far better to see customers leave the soda counter by dozens, than singly from the prescription desk, for although they may go away disappointed and thirsty, they will carry with them the fixed conviction that in your pharmacy, pharmacy yields to nothing, and when to them the day of distress arrives, you will be rewarded for your faithfulness to yourself and your profession.

I have frequently thought that we are unfaithful to our trust in another particular, and in accordance with our president's instructions I will mention it, in the hope that it may cause the much-to-be-desired discussion. To what extent are we warranted in selling opiates? Are we justified in endeavoring to increase their sale? Are we true to our conscience when we meet the price of another dealer as represented by the would-be purchaser? It seems to me that the sale of opiates to the debased creatures who have become its slaves is the most disgusting and degrading feature of the drug business, and while I cannot understand how anyone should desire to cater for such trade, I for one am perfectly willing that they should have it. An opium eater is naturally a liar and a thief; you would not dare trust one of them within reach of his or her coveted drug unwatched; their money is hoarded to buy that drug alone; they are outcasts from society; they are beneath the notice of the honest laborer; although themselves possessed of wealth, they are a disgrace to a pharmacy. Sneaks and hypocrites, what have we in common with them? I hear you say, "but they must have their opium." Why? Because by the aid of competition they have been enabled to purchase the drug that has degraded them. Who is responsible for this? Shame upon our profession, it is ourselves, who else sells the degrading drug? Who has reduced the price of morphine from a dollar to forty cents a bottle and opium from seventy-five to twenty-five cents an ounce? Ourselves. Who has reduced the price of laudanum from fifteen to five cents an ounce? Ourselves.

Who delivers laudanum unlabeled at request? The pharmacist. Does he do this blindly? No. He knows full well the regular customer, he needs not to ask his wants, the extended bottle taken, filled, delivered without a word, tells only too plainly the miserable pitiful story of a ruined life. For a few paltry dollars reeking with misery and degradation, we have competed as for a prize. It is a disgrace, and a blotch upon our escutcheons, placed there by our own hands.

We alone are responsible for the enormous sales of chloral, cocaine, opium and its products, and others of their miserable kind, by the pharmacists of the world. We owe it to ourselves to remove the stain, cost what it may. Will we do it?

The discussion was opened by Mr. Bassett, who said: "I guess they are all in it, as they don't seem to say anything, but on a paper of this character I don't think we ought to sit quietly. The course that is pur-

sued in the store with which I am connected regarding this matter is that we have out prices on these goods, which is fairly remunerative to us, and if people come in to buy these things and we are satisfied that they are not going to kill themselves we sell to them. The instructions we give to our clerks are to invariably discourage the sale of this class of goods; not only not to seek the trade, but to discourage it. We treat it just as we do the sale of liquors, that is to discourage anything which we think is not perfectly legitimate, although it may be lawful."

MR. VEITCH: As has been said, this is a paper worthy of notice. I think that conscience should be the ruling factor with reference to our dealings. I know what it is to deprive myself of the sale of articles which other druggists deal in. I do not think a drug store is a proper place in which to sell tobaccos and liquors to those who are in the habit of using them for intoxicating purposes. I do not cater to that trade, nor to the opium trade. When a person comes in and asks me to put up four ounces of laudanum I say it is worth so much. We certainly should extend the slaves of these habits our sympathy. They are laboring under a fearful curse and God help them to release themselves from it. It should be our duty to discourage persons in the use of these things. I refer not only to opium, but to tobacco and liquor. I don't want a tobacco trade, nor a liquor trade; I want a drug trade and I want to feel when night comes that I have not a guilty conscience.

Secretary H. J. Brown then submitted his annual report, as below:

SECRETARY'S REPORT.

September 17th, 1890.

To the Officers and Members of the Michigan State Pharmaceutical Association:

In presenting this my last annual report I desire to acknowledge with gratitude the hearty and intelligent assistance which has been rendered me by the officers and many other members of the association. The only suggestion I have to make is that the association should try to derive some means for the collecting of the annual dues. Repeated notices mailed to delinquents fail to bring as large returns as they ought, and it has been suggested to me that possibly we might make some arrangement with the traveling salesmen of the various wholesale drug houses of the state to do this collecting for us. When I state to you that there are 112 members who have not paid 1888 nor 1889 dues, and 182 who have paid 1888 but not 1889, making $400 in back dues uncollected, you will see the necessity of some action. Of course none of these 300 who are in arrears for 1888 and 1889 have paid the 1890 dues, and are not likely to unless they are solicited personally. Including this year's dues, many of which will yet be paid, there are over $1,000 unpaid.

The receipts and disbursements for the year have been as follows:

RECEIPTS.

For Membership Fees, Dues and Certificates	$682 00
For Advertisements in Proceedings	160 00
For Sale of Copies of Proceedings	3 75
	$845 75

DISBURSEMENTS.

1889.			
Sept. 18.	To William Dupont, Treasurer		$ 51 00
Sept. 19.	" " " "		52 00
Sept. 20.	" " " "		25 00
Dec. 9.	" " " "		12 20
1890.			
July 17.	" " " "		195 82
Sept. 16.	" " " "		14 85
Sept. 17.	" " " "		494 88
			$845 75

The following orders have been drawn:

1889.				
1.	Sept. 18.	A. H. Lyman, Traveling Expenses		$ 8 55
2.	" "	F. J. Wurzburg, " "		7 00
3.	" "	Wm. A. Hall, " "		9 15
4.	" "	H. J. Brown, Salary as Secretary		225 00
5.	" 19.	A. Bassett, Rent of Y. M C. A. Hall		60 00
6.	" "	" " Salary as Local Secretary		50 00
7.	Nov. 22.	H. Whittaker, Stenographer		75 00
8.	Dec. 3.	Calvert Lith. Co., Certificates		4 00
9.	" "	H. J. Brown, Engrossing Certificates, &c.		12 20
1890.				
10.	July 16.	Sheehan & Co., Envelopes, &c.		9 32
11.	" "	H. J. Brown, Postage		50 00
12.	" "	R. A. Beal, Printing		211 50
13.	Sept. 2.	D. O. Haynes & Co., Expenses of C. W. Parsons, Delegate to Washington		65 25
14.	" 16.	H. J. Brown, Postage, &c.		14 85
				$801 82

The following members have resigned:

J. P. Haller,	Martin Weller,
Geo. E. Williamson,	W. E. Osborne,
A. W. C. Gregory,	Frank Wells.

There have been reported to me as having died the following:

W. W. Swinnerton, Morrison Bailey,
V. H. Middleton, Dr. S. H. Douglas, one of our Honorary Members.

The following have been dropped by request and for non-payment of dues.

Henry Wiede, H. E. Grand-Girard,
Florence Henderschott, (married) W. F. Grosse,
J. A. McPhee.

Respectfully submitted,
H. J. BROWN, Secretary.

Approved, Sept. 18, 1890.

C. A. BUGBEE,
D. E. PRALL,
Executive Com.

Treasurer Wm. Dupont's report was as follows:

TREASURER'S REPORT.

September 17th, 1890.

The Michigan State Pharmaceutical Association:

RECEIPTS.

1889.					
Sept. 19.	To balance on hand				$ 423 18
" "	" cash		$ 51 00		
" 21.	" "		77 00		
Dec. 9.	" "		12 20		
1890.					
July 18.	" "		195 82		
Sept. 17.	" "		509 73		
					845 75
					$1268 93

DISBURSEMENTS.

1889.				
Sept. 19.	By paid A. H. Lyman,	1	$ 8 55	
" "	" " Y. M. C. A.,	5	60 00	
" "	" " W. A. Hall,	3	9 15	
" 21.	" " F. J. Wurzburg,	2	7 00	
" "	" " H. J. Brown,	4	225 00	
" 23.	" " Arthur Bassett,	6	50 00	
Nov. 29.	" " H. Whittaker,	7	75 00	
Dec. 9.	" " Calvert Lith. Co.,	8	4 00	
" "	" " H. J. Brown,	9	12 20	

1890.						
July 18.	"	"	Sheehan & Co.,	10.....	9 82	
" "	"	"	H. J. Brown,	11.....	50 00	
" "	"	"	Estate of Rice A. Beal,	12.....	211 50	
Sept. 17.	"	"	H. J. Brown,	14.....	14 85	
						787 57
" "	"	"	D. O. Haynes & Co.....			65 25
						801 82
			Balance on hand.....			467 11
						$1268 93

RECAPITULATION—RECEIPTS.

1889.			
Sept. 19.	To balance on hand.....	$423 18	
1890.			
Sept. 17.	Amount received since.....	845 75	
			$1268 93

DISBURSEMENTS.

1890.			
Sept. 17.	Amount paid out.....	$801 82	
	Cash on hand.....	467 11	
			$1268 93

Respectfully submitted,

WM. DUPONT, Treasurer.

Approved, Sept. 18, 1890.

C. A. BUGBEE,
D. E PRALL,
Executive Com.

On motion both reports were referred to the Executive Committee.

After remarks by Messrs. Vernor and Eberbach regretting the withdrawal of Mr. Frank Wells from the association, and relating the good work he had done in securing the passage of the pharmacy law and in other ways, a motion was made and unanimously carried that Mr. Wells be made an honorary member.

PRESIDENT: The next business in order is the election of officers. As it is necessary to the successful working of our association that we should exercise our best judgment in the election of officers and the appointment of committees, I hope that care will be used. I understand that Mr. Haynes desires to make some remarks upon this subject, and we will be pleased to hear what he has to say.

MR. HAYNES: I feel that some apology or explanation is necessary for my remarks at this time, and I hope that you will accept my state-

ment that whatever I may say is said for the best interests of the association. Situated as I am and publishing a journal for the drug trade, very many reports come to my ears regarding the association. Some are very complimentary and some are quite the contrary. Many druggists throughout the state are thoroughly dissatisfied with the association and that they believe it of no benefit. They say they do not care so much about the dollar, but they can see no benefit to be derived from it. The druggists of this state are in business for the money they can make out of it. While they may like to meet once a year and have a good time, they want to see where they can make something. I have had a talk with a number of the members, and I suggested to the president that if he thought it was appropriate I would call attention to the duties of some of the committees and suggest a change in the working of some of the committees, so that we can accomplish more. The whole work of the association for the coming year depends upon the choice of your officers. You must select those who will fulfill the duties of their offices and when members accept positions in the association they must expect to give them attention. As an illustration of this allow me to refer to the duties of the Committee on Legislation.

(Reads duties of committee.)

When that committee was called upon to report yesterday they had no report to make. I know there are many druggists in this state who would like to know what regulations are in force in other states, and I am sure they would be very much interested in having a strong report from that committee, but as it is we have none. If each committee will perform its part and each officer shall do what he ought, there is no question but the success of the association will be assured. We all know what we want in a president and in electing our officers we should divide up the commercial and the educational interests. In the American Pharmaceutical Association they have different sections. In order to have two sections in session at a time, you have to have two presiding officers, but our constitution does not provide for that. I do not think the work of the association is sufficient to necessitate that two sections should be in session at the same time, although that emergency is liable to arise and it is just as well to provide for it. It can be done without changing the constitution. Have it understood that the first vice-president shall be the chairman of the Committee on Trade Interests and select a man qualified for that position. That the second vice-president be chairman of the Committee on Pharmacy and Queries. As far as the Committee on Legislation is concerned, let it be understood that the third vice-president will be chairman of that committee. If you select men for your committees that are adapted for the work, you will surely accomplish something. With reference to the Committee on Trade Interests and the subject generally we should thank Mr. Colman and congratulate him on the success he has made at this meeting. I think it ought to be understood that the chairman of the Committee on Trade Interests is expected

to have a programme and have the whole thing mapped out and be ready to proceed when he comes here, and when the meeting is called to order he will proceed so that the matters in his committee will have attention, and the same will be true of the other committees. I would suggest that members be solicited to send in samples of preparations they put up themselves, perhaps not of all the preparations, but of the best. If some man thinks he can make a better suppository than another, let him prove it and let him tell how he does it, and so with other preparations, and then we can have these things all arranged when the members come here and they can feel that they have learned something. It has been suggested that it might be well to have a competitive exhibition in the manufacture of some particular article. There is no end to the entertainment they could give us. If thought advisable they could prepare a lecture on some subject, and let that entire work be in charge of the chairman of that committee.

We have done considerable in the way of talking since we came here, but that is about all. But suppose it was planned that the chairman of the Committee on Trade Interests, as soon as the general business was out of the way, was to take charge of the session and he had it arranged who he would call upon, he could thus push through his business and accomplish much more than could be done in any other way.

Your secretary should be more of a clerk than employer. It is largely a clerical position, at the same time an important one. He should be the servant of the association and ready at all times to do the clerical work for the heads of committees, as well as officers. It means a great deal of work, but he should be paid for it as liberally as the association can afford. Further, he has the important duty of collecting the dues. Circular letters do not always bring dollars; personal application is necessary. Mr. Brown has suggested that this might be accomplished by traveling men. I know the traveling men have helped us very materially in securing new members and I understand they are willing to continue the work. I believe the secretary should be a permanent officer as long as he performs his duties properly. I understand Mr. Brown does not care for it, so you must look to another man and you must look for a man who is capable of filling it in every respect.

I believe the secretary should be located in Detroit. I say this because Detroit is the commercial center of the state and there are more druggists in Detroit than in any other one locality in the state, and he could see more druggists there. The heads of committees will get there more frequently to see him, and he can arrange with the traveling men to carry on the work, and there are so many advantages in it that I do not see how any one can look at it in any other way, and I know there are many others who agree with me.

Mr. Vernor, as one member of the Committee on Legislation, plead guilty to the charge of ignorance of his duties, and would suggest that after adjournment of the association the secretary notify the members of

the committees and call a meeting of the committees in the name of the chairman of each, so they may know what their duties are.

Mr. Brown could see no particular force or object in the suggestions that the vice-presidents be chairmen of the committees named, but could see decided advantage in not having that arrangement. There is no surer way to interest a man in the work of the association than to give him something to do. Have each committee so arranged that its chairman shall be independent of the vice-president and in that way enlist three or four other men in this work. He also thought the secretary should live in Ann Arbor, because cheaper printing could there be procured, and because a great portion of the papers are prepared by the students in the School of Pharmacy, under the supervision of Prof. Prescott, Prof. Stevens and others, and the secretary would have the advantage of the aid of these gentlemen. He would place Prof. A. B. Stevens' name before the association (in his absence and without his knowledge) as a fit man for the office of secretary.

ELECTION OF OFFICERS.

While an informal ballot for president was being taken, Mr. Heath, of Ohio, Mr. Haynes and Prof. Prescott entered into a lively discussion regarding the relative merits of the Ohio and Michigan associations.

Tellers Dupont and Caldwell announced the result of the informal ballot to be that Mr. D. E. Prall had received thirty-six votes out of a total of fifty-four, and on motion the ballot was declared formal, and Mr. Prall was unanimously elected president of the association.

MR. PRALL: Mr. President and Members of the Association: I have been trying to secure a recognition by the president for the purpose of saying that I did not want to exhibit a false pride or a mock modesty. I only want to do and have done what is for the best interests of the association. It has seemed to me that for this important office one older and more experienced would do much better than one of my age, and I can only excuse this action on the ground that the association is prospecting for merit, as I am not aware of having done anything to deserve the honor. I was surprised about two hours ago when my name was mentioned for this office, because nothing has been farther from my mind. In electing me to this office you will heap coals of fire upon my head, because I have been as apathetic as anybody could be to the interests of this association. I have always had a kindly feeling for the association, but never have had an opportunity to do anything for it before this meeting. As this action has gone so far that it is irrevocable now, I will only say I will do all I can to forward its interests.

Informal balloting resulted in the choice of H. G. Colman as first vice-president, and on motion Prof. A. B. Prescott and James Vernor were respectively declared second and third vice-presidents.

Several names were presented for position of secretary. Mr. A. W.

Peck presented that of C. A. Bugbee, of Cheboygan, and upon balloting Mr. Bugbee was elected.

MR. BUGBEE: I thank this association for the honor conferred upon me. The success of the association has been due in the past largely to the faithful officers it has had in the position to which you have elected me. I shall do the very best in my power to serve the association and its interests.

The salary of the secretary for the past year and for the coming year was fixed at $225.

Mr. Wm. Dupont was unanimously re-elected treasurer, despite his protests.

As the result of various motions the following were elected members of the

EXECUTIVE COMMITTEE:

L. Pauly, chairman, St. Ignace. D. O. Haynes, Detroit.
George W. Stringer, Detroit. A. H. Webber, Cadillac.
O. P. Safford, Flint.

The election of delegates was postponed, and the meeting adjourned.

SEPTEMBER 18, 9 A. M.

Vice President Vernor called the meeting to order.

Prof. Prescott read a brief, informal report from A. B. Stevens, delegate to the American Pharmaceutical Association, and followed it by an informal report from the Committee on Adulterations, prepared by E. A. Ruddiman, as follows:

HYPOPHOSPHITES.

The Hypophosphites of Lime, Soda and Potassa examined were comparatively free from impurities. One sample of Lime Hypophosphite contained 84% insoluble matter and 1.5% Sulphuric Anhydride (SO_3). One sample of Potassa Hypophosphite contained about 1% impurities, the others giving only a trace of foreign matter. None of the Sodium Hypophosphites contained over 1.5% impurities, which consisted of Sulphates, Carbonates and Calcium Salts.

The so-called Iron Hypophosphites contain a larger percentage of matter not soluble in Acetic Acid, in one case the per cent. being 75.4 and in another 69.9.

ACETATE OF POTASSIUM.

The testing of this salt showed no impurity present in quantities large enough to estimate.

ACETATE OF ZINC.

There was an indication of the presence of other metals, but only in very small amounts.

SODIUM SALICYLATE.

Contains a sulphate as its principal impurity to the amount of about 1.5%.

SILVER NITRATE.

One grm. of silver nitrate when precipitated with hydrochloric acid gave .83 grm. of silver chloride instead of .84 grm. This with other tests showed the salt to be practically pure.

LACTIC ACID CONC.

Samples from three manufacturing houses were pure.

TARTARIC ACID.

The samples examined contained only a trace of sulphate and metals and were practically pure.

ARSENIOUS ACID.

Samples from three houses were examined and the amount of pure arsenious anhydride and averaged from 87.8 to 95.8%.

The report was accepted and ordered printed in the proceedings.

Prof. Prescott read a paper by A. B. Stevens and T. Palmer, on "Solution of Citrate of Magnesia," as follows:

The U. S. P. formula for solution of citrate of magnesia has not given general satisfaction. It is unnecessarily complex, requiring not only the manufacture of syrup of citric acid, but also the manufacture of the ingredients from which the syrup itself is made. The syrup is usually cloudy and imparts a cloudiness to the solution of citrate of magnesia, and the solution as generally manufactured deposits a copious precipitate in a short time.

It is evident that the committee of revision must revise the official formula if they expect the formula to come into general use.

The present paper is a record of the results of several experiments made with the view of ascertaining the best formula.

Various formulas were tried during this investigation, of which only a few are worthy of mention.

It is now quite generally admitted that, of the salts of magnesia and citric acid, the acid salt ($Mg\ HC_6H_4O_7$), is the most active as a cathartic. The precipitate which usually forms in the solution is the sparingly soluble neutral or basic citrate $Mg_3\ (C_6H_4O_7)_2$. This precipitation may be prevented by increasing the amount of citric acid, which would form an additional amount of the more active acid citrate. A few formulas have been published wherein the originators aimed at the formation of a sufficient amount of the acid citrate to produce the same medicinal action as the solution made after the U. S. P.

The formula advised by Prof. Patch in the *American Druggist*, 1889, p 197, *Pharmaceutical Era*, September, 1889, p 337, gives about the right amount of magnesia, but uses at least 100 grains more of citric acid than is necessary for the formation of the acid citrate, thus making the solution disagreeably acid. The solution keeps well, but the method is too complicated for practical use.

A better formula is that recommended by L. F. Stevens, in an excellent paper which appeared in the *Pharmaceutical Era*, December, 1889, page 458, *Drug. Circ.*, 1889, page 245, as follows:

Carbonate of magnesia,		121	grs.
Citric acid,		263	"
Oil lemon,		2	"
Syrup,		1½	fl. ozs.
Bicarbonate of potassa,		30	grs.
Water,	q. s. ad.	12	fl. ozs.

Place the acid and carbonate of magnesia in powder or in fragments, in a deep dish. Add 4 fl. ounces of water and agitate till dissolved. Pass through a wetted filter, large enough to contain all of the solution. Cover closely and receive the filtrate in a 12 ounce bottle, containing the syrup. Wash the filter with sufficient water to make 12 fl. ounces, add 30 grains bicarbonate of potassium. Cork and tie.

This formula makes a clear sparkling preparation which keeps well and is quickly and easily made. This solution contains but little more than half the amount of magnesia directed by the U. S. P., yet it is claimed that it is just as active. Several doses were, however, administered to different individuals at different times, when it was found to be somewhat less active than the U. S. P. solution.

After exhaustive experiments it was found that the desired results could be obtained by increasing the magnesia twenty grains, and the acid sufficient to maintain the acid citrate. The formula would then read as follows:

Magnesia carbonate,	140 grs.	9.075	gm.
Citric acid,	325 "	21.025	"
Oil lemon,	2 "	.128	"
Simple syrup,	1½ fl. ozs.	45.	cc.
Potassium bicarbonate,	30 grs.	2.	gm.
Water, q. s. ad.	12 fl. ozs.	355.	cc.

Make according to preceding directions.

This would seem to be the most rational or scientific formula, but should it be thought best to maintain the same amount of magnesia as at present officinal, we would recommend the following:

Magnesia carbonate,	200 grs.	13	gm.
Citric acid,	415 "	26.5	"
Sugar,	960 "	62.	"
Oil of lemon,	2 "	0.128	"
Potassium bicarbonate,	30 "	2.	"
Distilled water, q. s.			

Dissolve the acid in 8 fl. ounces (240 cc.) of water, add the magnesia carbonate, and when dissolved add the sugar, which has been previously triturated with the oil of lemon. When dissolved filter into a 12 oz. (355 cc.) bottle, and add water through the filter to 12 fl. oz. (355 cc.) Then add the bicarbonate of potassium, cork and tie. This preparation is clear and sparkling, is easily made and pleasant to the taste, and keeps for an indefinite time. Bottles opened three months after being made were just as good as when freshly made.

The discussion following this paper called out the views of several gentlemen. Mr. Eberbach thought the fungus growth often noticed was due to impurity of the water. Many distilled waters are made from waste steam, and usually have very slight traces of vegetable impurities. He had long adopted and would recommend thorough boiling of the water before making the solutions. He thought best results were achieved by leaving out the bicarbonate until the time of dispensing. Thus there is no trouble, no deposit, no fungus, and the solution when it goes out of the store is fully charged with carbonic acid gas.

Mr Dupont gave this formula he had used for twenty three years with good success: Calcined magnesia, 2 ounces, citric acid, 10 ounces, spirit of lemon, 1 ounce, syrup of lemon, 18 ounces, water, qs. to 9 pints, each bottle to contain 40 grains potassium bicarbonate. Dissolve the acid in 8 pints of water and add the calcined magnesia, and wait till dissolved. Then add the lemon flavors, the remainder of the water and filter. This will keep any length of time.

Prof. Prescott: I think the fungus growth would be liable to form unless the water is boiled immediately before the preparation is made, and to make sure of the matter the bottles could be rinsed with boiling water; in other words the materials sterilized. There is enough organic matter to support the growth of the fungus, even if you used

pure distilled water. Distilled water exposed to air will support some growth; it can't be helped. My own judgment is that the preparation should be increased in strength rather than diminished. It has to compete with the cheaper and more readily prepared dry preparations of so called citrates of magnesia, but they are very ineffective, as a rule containing but little citrate of magnesium, for the very good reason that citrate of magnesium cannot be held in a solid form any length of time so it will dissolve readily enough in an effervescent preparation.

Prof. Prescott then read a paper on "Examination of Castor Oil," by George S. Hawes:

Pure castor oil should have a sp. gr. of .950 to .970 and respond to the following tests:

Ten grams of oil, thoroughly mixed with 1 gram of nitrate of silver solution, (nitrate of silver, 5 parts, nitric acid, sp. gr. 1.42, one part, alcohol, 100 parts), and kept in boiling water five minutes, should not give a deep red color. This proves the absence of cotton seed oil. Should not be perfectly soluble in petroleum spirits (sp. gr. .670.)

Should be soluble in two parts of alcohol, 90 per cent. (by weight.)

Should form a clear solution with glacial acetic acid in all proportions. The following is a tabulated statement of the result of the examination of twelve samples of commercial oil:

	Silver Solution.	Petroleum Spirits.	Alcohol, 90% by wt.	Glacial acetic acid.	Sp. Gr.
No. 1.	No red color.	Insoluble.	Soluble.	Soluble.	.9537
" 2.	" " "	"	"	"	.9600
" 3.	" " "	"	"	"	.9670
" 4.	" " "	"	"	"	.9640
" 5.	" " "	"	"	"	.9690
" 6.	" " "	"	"	"	.9640
" 7.	" " "	"	"	"	.9590
" 8.	Red color.	"	Insoluble.	Insoluble.	.8000
" 9.	No red color.	"	Soluble.	Soluble.	.9560
" 10.	" " "	"	"	"	.9570
" 11.	" " "	"	"	"	.9700
" 12.	" " "	"	"	"	.6590

Several mixtures containing from 5 to 50 per cent. of cotton seed oil were tested, and the impurity was easily detected in every instance.

Mixtures of castor oil, and from 10 to 80 per cent. of other fixed oils were found to be insoluble in 90 per cent. alcohol.

Prof. Prescott then presented a volunteer paper by H. W. Snow, Ph. C., entitled "The Iodine Absorption of Essential Oils as a Criterion of Purity."

In the "New Idea" for March, 1889, p. 19, the writer presented the results of some work performed on the absorption of iodine by essential oils. The work included the examination of twenty-one essential oils and three stearoptens. These results were meagre but interesting, and at that time no similar work had appeared in English. Unknown to the writer, however, Mr. C. Barenthin had published, in the Archiv der Pharm., for October, 1886, the results of determinations for eighteen oils, though no translation had appeared in English. The next month Mr. R. H. Davies published an interesting paper on the same subject, giving the

results of determinations of twenty-nine essential oils and four stearoptens. Mr. Davies was likewise unaware of the work done by previous investigators, though he afterwards traced the work of the German pharmacist and was able to compare it with his own. Six months later Mr. Rowland Williams, strange to say, wholly unaware of the work done by pharmacists, notwithstanding the discussion it had created in his own country, gave in the Chem. News, October 11, 1889, p. 175, the result of his own work, saying: "To the best of my knowledge this test has never before been applied to essential oils." Four papers have therefore appeared on this subject, and it is the object of this one to compare the work of the different investigators, to add some further results obtained by the writer, and to draw such conclusions as seem to be warranted from its present status. The details of the process it is unnecessary to give, simply referring to it as the well-known Hubl's process for determining the iodine absorption of fixed oils and fats.

TIME OF DIGESTION.

The absorption by this method, as applied to fixed oils, is complete in from three to four hours. The writer seems to have been the only analyst who performed any experiments with a view to fixing the proper time of digestion of the iodine solution and essential oil before titrating to determine the excess. The others either ignored the question or assumed that it was completed in the same time as is the case with fixed oils. Barenthin digested his iodine solution and oil together for "three or four hours." Mr. Williams makes no mention of the time, though his failure to specify any different time would lead us to believe that he too took the usual time. Mr. Davies, on the other hand, allowed his oils to stand in contact with the iodine "during one night," which would probably be from 15 to 17 hours' time. The writer may give here a tabulated statement of the results of determinations for different perions of time:

	Time of Digestion.					
	3 hrs.	6 hrs.	15 hrs.	24 hrs.	40 hrs.	48 hrs.
Oil Peppermint.....	21·1	22·8	24·5			
" "					179	179
" "					110	110
" "					120	126 !
" Bergamot..			300			345
" Orange Peel (Bitter).....			321			362
" Turpentine.....	291	33·3	345	353		397
" Pepperm't (Adult).		84·7 !	74·1 !			
" Pepperm't (Adult).		88·3 !	73·6 !			
" Thyme			210 !		188 !	
Thymol			201 !		181 !	

From these results, and some observations by Mr. Davies, we may infer that the rate of absorption is not equal for all oils, and perhaps not even for all samples of the same oil. Also, it is evident that, in many instances, the absorption is not complete within a period of twenty-four to forty-eight hours. Though in four instances the longer digestion shows less absorption than the shorter period. This same phenomenon was also noticed later in the case of turpentine with simple chloroform solution of iodine.

These experiments are not in themselves sufficient to fix the proper length of time in which the oils and iodine should remain in contact, but in the writer's work 40 to 48 hours was at first allowed. This, however, is too long for practical purposes, and a conventional time will probably have to be adopted. The "standing over night," or a period of about 16 hours, recommends itself to the writer, and in recent work has been followed.

Oil.	Barenthin. Time, 3 to 4 hrs.	Williams. Time, 3 to 4 hrs.	Davies. Time, about 16 hrs.	Snow. Time, about 16 hrs.	Snow. First work.	
					15 hrs.	40 hrs.
Oil Almonds			*None.			
" " (prussic acid, free)			*None.			
" Aniseed		274·4				121·0
" "		185.9				
" " Russian			189·7			
" " star anise				186·0		
" Bergamot	260·0	247·9	276·1		300·0	345·0
" "		288·7				
" Birch, see Winter-green						
" Cajeput		70·8				
" "		151·0				
" Chamomile			*68·1			
" "			*72·1			
" "			65·5			
" Calamus	155·0		181·4			
" Camphor						129·0
" Caraway	265	258·3	*254·9			233·0
" "		263·2				
" Cardamom			*189·3			
" Cassia		75·1	159·5			
" "		71·7				
" Cedar wood		78·5				
" " "		74·8				
" Celery			*311·6			
" Cinnamon	100·0	128·1	189·5			
" "		105·1				
" Citron		359·7				
" "		320·0				
" "		353·9				
" Citronelle		191·3				
" "		186·3				
" Cloves	270·0	179·8	*362·5	354·0		467·0
" "		155·5	*355·1		291·0	
" "			*349·5			
" " (half from stems)			*366·6			
" Copaiba				260·0		250·0
" Coriander						335·0
" Cubebs			296·8	268·0		
" "			228·1			
" "			296·0			
" Cummin			81·6			
" Dill			*257·1			
" Erigeron						260·0
" Eucalyptus	235·0	61·7				
" "		106·5				
" "		110·7				
" Fennel	140·0		158·3	175·0		
" Juniper	245·0	278·6	*337·3			
" "		236·1	363·9			
" "		250·1				
" Lavender	170·0					286·0
" " Eng		282·9	265·5			
" " " Mitcham		280·4	278·9			
" " " "		248·6	274·9			
" " (French)		198·6	294·5			
" " "		237·2	262·7			
" " "		199·2				
" " Spike		237·9				
" " "		207·1				
" Lemon	235·0	328	328·3			343·0
" "		320·2	340·3			
" "			345·3			
" "			348·9			
" "			348·0			
" "			345·6			

Oil.	Barenthin. Time, 3 to 4 hrs.	Williams. Time, 3 to 4 hrs.	Davies. Time, about 16 hrs.	Snow. Time, about 16 hrs.	Snow. First work.	
					15 hrs.	40 hrs.
Oil Lemon			355·1			
" Lemon grass		223·2				
" " "		271·5				
" Limes						289·0
" Mace		220·8				
" "		224·0				
" Nutmeg		201·9	*308·3			
" "		206·2	321·5			
" Orange		347·7				
" "		341·7				
" " Bitter					321·0	362·0
" Origanum	227·0					
" Parsley			255			
" Peach Kernel			None.			
" Pennyroyal		85·9	188·9			152·0
" "		78·6				
" Peppermint, Amer		71·7	132·2			179·0
" " "		53·1	143·9			109·0
" " "			121·8			146·0
" " "						118·0
" " "						71·0
" " Eng		36·8	51·2			
" " "		46·4	49·6			
" " "			57·7			
" " Jap		56·1	48·1			64·0
" " "		37·1	43·5			
" Petroleum				Small am'ts.		
" Rosemary	185·0	161·7	325·			
" "		142·4				
" Rue		192·0				
" "		121·3				
" Sage		49·7				
" "		117·0				
" Sandal wood			226·6			
" " "			238·9			
" Savine			279·5			
" Sassafras		162·7				166·0
" "		151·0				
" Spearmint			207·3			
" Thyme	170·0				210·0!	183·0!
" " (red)		181·5				
" " "		168·4				
" Turpentine	300·0		377·0		345·0	397·0
" Valerian	80·0					
" Verbena		267·8				
" "		247·8				
" Wintergreen, true						1.0
" " " (oil birch)						2·3
" " " synthetic						3·8
Anethol			177·4			
"			182·9			
"			177·8			
Camphor			0·46		2·8	
Menthol			0·12			None.
Thymol			171·5		201·0!	181·0!

COMPARISON.

In the foregoing tables, the results obtained by the different operators are placed side by side for comparative purposes. It must be borne in mind that the difference in time allowed by the different operators may produce different figures. Mr. Williams and Mr. Barenthin having evidently operated during the same length of time, it is possible to compare their results. The writer's later work, however, that in the fourth column, was performed with about sixteen hours' digestion

("over night"), and can, therefore, be compared with that of Mr. Davies. The number of oils examined was limited, but I may say that those given in column four were of my own distillation, and their purity is therefore assured.

The writer will not attempt to pass any extended remarks on these figures. A critical examination of them speaks for itself. However, attention may be directed towards Aniseed, Cassia, Cinnamon, Cloves, Eucalyptus, Juniper, Nutmeg, Pennyroyal, Peppermint, Rosemary and Sage.

As regards purity, it may be said that Mr. Williams obtained the oils under assurance of their purity, the purpose to which they were to be put having been specified. Mr. Davies felt the "utmost confidence in the genuineness" of those oils, marked in this table with an asterisk. Some of the oils used by the writer were distilled in small quantities by himself, for the purpose of this examination, viz: those in column four. The others were purchased in open market from good sources, though no mention was made of the purpose to which they were to be put.

CHLOROFORM IODINE.

The long time required to complete the reaction in the use of Hubl's solution, the instability of this solution and certain peculiarities which it exhibited led the writer to try a simple chloroform solution of iodine, the process being otherwise conducted the same. The results as obta'ned in different periods of digestion, are very different to those obtained by the use of Hubl's solution and the action may be said to be more rapid though it is not uniform for all oils. The results are given in the following table for a limited number of oils as follows:

	Time of Digestion (hours.)								
	4½	7½	8	18½	22	24	49	55	Hubl's
Oil Turpentine	98	91			80				397
" Peppermint	46	48			50				113
" Copaiba	81			81					250
" Coriander	81			76					286
" Cloves	29			56		72	122	121	291
" Camphor	45		58						129
" Limes	67		62						289
" Sassafras	35		43						166

FRACTIONAL DISTILLATION.

The writer scarcely looks for a close degree of uniformity in the "iodine numbers" of essential oils. It is scarcely to be expected that bodies of such complex composition as these essential oils will furnish "constants" in the ordinary use of the term. The variations in specific gravity and boiling points, as well as the variable specific rotatory power of those that are optically active is well known. The iodine number, as already reported upon, is in some cases quite constant. In casting around for some means of partially compensating for this variation the writer naturally first thought of fractional distillation. Some of the advantages which accrue from it were pointed out in a paper on Oil of Peppermint, in which it was shown that a fraction of one dram from one ounce of oil of peppermint did not have a much higher absorption number than the oil undisturbed by fractional distillation. The figures, as then obtained, were 105 for the natural oil, and this yielded a one-eighth fraction having 123 for the number, while the pure oil to which was added 18 per cent. of turpentine yielded after fractioning 280 for its iodine number. At that time experience justified the statement that an oil yielding, from the fraction of one dram from one ounce, less than 125, for its iodine absorption is not very likely to be adulterated with turpentine. Only once thus far has the writer found an oil having a higher absorption in the original than this

and as already stated that oil is still open to question. If the oil exceeds 195 it is a suspect and running over 185 may be discarded. With much turpentine present the fraction will have an absorption power over 225.

Since then, an oil examined by more thorough fractional distillation, taking one-eighth of one-fourth, the distillation being conducted in a 4 oz. fractional distillation flask, showed 146 and 228. Notwithstanding the fact that by the statement above, this oil should have been excluded, it was passed. If it contained any turpentine, the amount was too small to be of any consequence. The high number of *oil of cloves* would indicate that iodine absorption would not be of much value in detecting turpentine if added. The ordinary turpentine of commerce can not be used as an adulterant of cloves to any advantage. Some trials by the writer showed conclusively that 1 in 8 could be readily detected by the nose, 1 in 16 was not so apparent and would pass, but when one-eighth was distilled in a small retort, the fraction was all terebinthinate in odor with only a faint suggestion of cloves. The oil pure, oil pure one-eighth fraction and the oil to which one-sixteenth of its volume of turpentine was added, showed iodine numbers (the time being 17 hrs.), as follows: 354, 364, 370; the indications so far as iodine numbers were concerned were worthless. The same oil and fractions were then tried with simple chloroformic iodine; bearing in mind that oil of cloves absorbed slowly, while turpentine was highest in a short period, only two hours digestion was allowed. Results were as follows: 54 for pure oil, 60 for the fraction and 100 for the fraction containing turpentine; with oil of camphor somewhat similar results were obtained. Oil of camphor, one volume, was added to seven volumes of the same oil of cloves, as in the preceding. Its presence was not noticeable by the sense of smell, but in the fractions could be distinctly noticed; with Hubl's solution, the iodine numbers were 354, 364, 382. This completes the writer's work to the present. Fractional distillation promises well in connection with this line of investigation. It is hoped that others will follow up the subject, as it is my intention to collect data as rapidly as other duties will permit.

The following papers were read by title:

"Tabulated Solubilities of Salts as given by Three Pharmacopœias," by C. W. Baker, School of Pharmacy, U. of M. Published in full in the *Pharmaceutical Era*, Dec. 1st, 1890.

"Alkaloidal Strength of Belladonna and Hyoscyamus," by H. A. Thayer, Ph. C., School of Pharmacy, U. of M. Published in full in the *Pharmaceutical Era*, Dec. 1st, 1890.

"Mustard; Determination of its Adulterants," by G. D. H. Baert, School of Pharmacy, U. of M. Published in full, with cuts of microscopic views, in the *Pharmaceutical Era*, Dec. 1st, 1890.

"Tests for Carbolic Acid," M. M. Levy.

"Chloral Hydrats," T. Klingdon.

"Valuation of Pepsin," O. P. Meyer.

The Auditing Committee reported that they had examined the vouchers and reports of the treasurer and secretary and found them to be correct.

On motion the report was adopted.

Mr. Bassett, of the Committee on President's address, reported as follows:

The first recommendation in the president's address is the matter referring to wholesalers supplying physicians, and the report which we de-

sire to make upon this matter has been anticipated by the resolution which has already been passed, so we will simply state that we recommend such action as was taken by the resolution.

The next recommendation was with reference to the preparation by druggists of household remedies. The committee heartily endorse the sentiments contained in this clause. We believe it is a source of profit and a very valuable adjunct to the business to have a line of preparations of this kind.

We also endorse the recommendation contained in the statement that it is not well for any man to attempt to rob another of what is justly his due.

The next clause recommending a more full consideration of trade interests meets the entire approval of the committee and we trust that the suggestion will be carried out in future meetings of the association.

The recommendation contained in the president's address regarding the re-appointment of members of the Board of Pharmacy the committee deem a very wise suggestion and we hope the association will act upon it.

This latter recommendation was referred to the association, and the debate which followed was animated and interesting. Mr. Vernor proposed a plan for ascertaining the wishes of the pharmacists of the state, regarding their choice of one to succeed the member whose term expires December 31, 1890. He would enclose blank voting sheets in his November announcements to the druggists, asking each to name his choice as member of the board, these returns to be tabulated and submitted to the Governor. Mr. Brown approved in part of this plan, but would limit it to members of the association. This latter view met with favor, as the association procured the passage of the pharmacy law and the appointment of the board, and it was but just that the members should have a voice in the selection of members of the board. Those who showed no interest in the association, and were not members of it, manifestly were not entitled to voice in the matter. The discussion was long, but resulted in an informal ballot to ascertain the wishes of those present, and a score of names were proposed. The following gentlemen were named on this ballot:

F. M. Alsdorf, Lansing.	Geo. McDonald, Kalamazoo.
L. T. Beach, Bay City.	H. Melchers, Saginaw.
H. J. Brown, Ann Arbor.	L. Pauly, St. Ignace.
H. G. Colman, Kalamazoo.	O. P. Safford, Flint.
Wm. Dupont, Detroit.	H. Thum, Grand Rapids.
Geo. Gundrum, Ionia.	W. E. White, Grand Rapids.

It was finally decided to place the whole matter in the hands of a special committee of three to present the question to the entire membership of the association. The twelve names standing highest in the informal vote be given and the member asked to indicate his preference. He is not confined to these names however, but may choose any he sees

fit. The president appointed as a committee to carry out this work, D. O. Haynes, J. W. Caldwell and Frank Inglis.

Delegates chosen were D. E. Prall, to the State Medical Association, and to the A. P. A. the following: G. J. Ward, St. Clair; J. G. Hogeboom, Saginaw; H. W. Snow, Detroit; George McDonald, Kalamazoo; D. O. Haynes, Detroit. Alternates, James Vernor, F. A. Thompson, A. Bassett, C. W. Parsons, Detroit; Albert Mann, Ann Arbor.

A hearty vote of thanks was tendered to the trustees of the Hoyt Library, to Mr. Smith, of the Aldine Hotel, to the East Saginaw and West Side Clubs, etc., for their hospitality and many courtesies. Fifty dollars was voted to the local secretary. The new president was installed.

Mr. Bassett, in a forcible speech, objected to papers which did not give the names of the manufacturers of the samples examined. He would also call the attention of the Committee on Legislation to the question of liability for damages in poison cases. As it is now, the proprietor is held responsible for the mistakes of the clerk, though the latter be a full-fledged, registered pharmacist. A resolution was passed that the committee look into this matter, and strive for proper legislation.

Mr. Bugbee was elected editor of the proceedings.

The committee appointed to consider the suggestions contained in the report of the delegates to the A. P. A. approved them, and on motion the recommendations were adopted.

MR. BROWN: I think it is very advisable that we should make a change in one of our by-laws regarding the election of applicants for membership. It quite frequently occurs that soon after our meetings some man will make an application for membership and we accept his fee for membership. In a few weeks he asks why his certificate has not come, and we are compelled to inform him that he cannot receive it until after the next meeting. It seems to me it would be well to amend Article 3 of the By-Laws so that an application received at any time might be submitted by the secretary to the Executive Committee and if approved by that committee the applicant be considered elected a member of this association. I move to amend our by-laws by amending Article III so that the fee shall include the issuance of a certificate, and to further change the by-laws by striking out that by-law which refers to the issuance of the certificate as now provided for, and I move that it lay upon the table until the next meeting, which will be this afternoon. I also move that Article II of the By-Laws, referring to membership, be amended, so that the Executive Committee may elect members at any time during the year.

PRESIDENT: Both motions will lie on the table until the next meeting.

A recess was then taken until two o'clock p. m.

FIFTH SESSION.—THURSDAY AFTERNOON.

On board steamer, D. E. Prall presiding. After some discussion, Ann Arbor was chosen as the next place of meeting; time, about October 15, and H. J. Brown was appointed local secretary.

Some discussion followed regarding the advisability of having the official year begin with January 1, instead of having it extend, as now, from one annual meeting to the next, but it was decided to make no changes.

The motions of Mr. Brown, regarding amendments of the by-laws, laid over from the previous session, were approved.

As the boat was nearing the dock, hurried adjournment was taken, until about the middle of October, 1891, when all will assemble again at Ann Arbor.

ADDENDA.

The following is the report of the committee to secure the expression of members of the association regarding the appointment of member of Board of Pharmacy:

DETROIT, Dec. 5, 1890.

HON. CYRUS G. LUCE,
Lansing, Mich.

DEAR SIR:—Referring to the inclosed circular, you will notice the method devised by the State Pharmaceutical Association for obtaining the wishes of the druggists, members of that association, relative to the choice of one to succeed the outgoing member of the State Board of Pharmacy.

The undersigned committee have carried out the instructions given them by the association, and herewith transmit to you the results of the ballots cast for member of the Board of Pharmacy. Of the total number of votes cast, Mr. Geo. McDonald, of Kalamazoo, received 174; Mr. F. M. Alsdorf, of Lansing, 84; Mr. Geo. Gundrum, of Ionia, 68; Mr. L. T. Beach, of Bay City, 44; Mr. L. Pauly, of St. Ignace, 42. These are the five names standing at the head of the list of candidates for this appointment, and are submitted to you as representing merely the wishes of the association.

Having been informed that you would be willing to receive such suggestions, the committee takes pleasure in calling your attention to this report, and would remain,

Most Respectfully,

D. O. HAYNES,
F. INGLIS,
J. W. CALDWELL,
Committee.

The following pharmacists have been elected to membership in the association, by the Executive Committee, since the adjournment of the Saginaw meeting:

Wm. Grossman, Saginaw. A. H. Powell, Gladstone.

Every member of the association should familiarize himself with the Constitution and By-Laws.

Notice of 1891 dues will be mailed about July 1st. Prompt replies to notices and the filing of receipts saves work and expense.

C. A. BUGBEE,
Secretary.

CONSTITUTION AND BY-LAWS.

ADOPTED AT PETOSKEY, MICHIGAN, JULY 13TH, 1887.

PREAMBLE.

WHEREAS, Organization, concert of action, and comparison of ideas, are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore,

Resolved, That we, druggists of the State of Michigan, whose names are hereunto attached, in compliance with an act entitled an act to organize the reputable pharmacists of the State of Michigan into an Association to be known as the Michigan Pharmaceutical Association approved April, 1887, do hereby organize ourselves into such Association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The object of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard, and, ultimately, to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.—MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry, and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.—OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected by ballot at the third sitting of the regular annual meeting of the Association, and to serve until their successors are elected.

ARTICLE V.—Duties of Officers.

Section 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, until the close of such meetings; call special meetings at the written request of twenty-five members; fill all vacancies that may occur in the offices of the Association between the annual meetings; shall present at each meeting a report of the Association, and perform such other duties as pertain to the office.

Section 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all monies for dues, and from all other sources, giving receipts for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee. He shall file a copy of the proceedings of each annual meeting in the office of the State Board of Health, and the Secretary of State, and shall keep at least three copies in his own office.

Section 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

Section 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association committed to their care.

Section 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.—Meetings.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.—By-Laws.

This Association may establish for its future government and regulation, such By-Laws, not in conflict with the Constitution, as may be deemed proper and desirable.

ARTICLE VIII.—Amendments.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.—Quorum.

Twelve members shall constitute a quorum.

ARTICLE II.—Membership.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented in writing, signed by two members in good standing, to the Executive Committee, and if favorably acted upon by that committee, the candidate shall be considered elected. A vote of all the members of the Executive Committee shall be required for an election.

ARTICLE III.—Fees.

The initiation fee of this Association shall be one dollar, which fee shall accompany the application.

ARTICLE IV.—Dues.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.—Certificate of Membership.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.—Committees.

Section 1. The President shall, before the close of each annual meeting, appoint the following committtees (of which he shall be an ex-

officio member), each to consist of three members, viz: Committee on Trade Interests; Committee on Pharmacy and Queries; Committee on Legislation; Committee on Adulterations.

SECTION 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.

SECTION 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable, to be reported upon at the next annual meeting.

SECTION 4. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.—SUSPENSIONS—AMENDMENTS.

SECTION 1.—These By-Laws shall not be suspended without the consent of two-thirds of the members present.

SECTION 2. Any amendment to these By-Laws must be made in writing and read before the Association at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these By-Laws.

ARTICLE VIII.—DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meeting of the American Pharmaceutical Association.

ARTICLE IX.—PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees and members, shall be published annually under the supervision of an editor, who shall be elected annually, and who shall be paid from the funds of the Association, and a copy of the proceedings shall be sent to each member of the Association less that two years in arrears.

ARTICLE X.—EXPULSION OF MEMBERS.

Any member or officer accused of violating the Constitution or By-Laws, or other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting. In every case definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the

charges, and notify him in writing, at least two weeks in advance, of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense.

ARTICLE XI.—Exhibits.

The Association invites manufacturers and others to exhibit at the annual meetings, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.—Rules of Order.—Order of Business.

Section 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

Section 2. The order of business shall be such as the Executive Committee shall prescribe.

Roll of Members.

		ELECTED.
Adams, H. M.	Port Huron	'88
Adams, C. H.	Otsego	'84
Akey, J. V.	Colon	'85
Albright, John H.	Colon	'89
Aldworth, F. G.	Grand Rapids	'84
Allen, A. W.	Detroit, 410 G'd River Ave.	'88
Allen, Earl	Grand Rapids	'87
Alsdorf, F. M.	Lansing	'83
Amberg, Isaac	Battle Creek	'86
Anderson, Ellery	Midland	'84
Anderson, Maxon	Midland	'84
Anderson, Edwin S.	Detroit, 159 Jefferson Ave.	'88
Anderson, C. N.	Detroit, 24 W. Adams Ave.	'88
Andrus, E. J.	Utica	'86
Armstrong, R. S.	Chelsea	'88
Arthur, Hiram	Dowagiac	'87
Atchinson, F. E.	Gladwin	'88
Atwater, C. H.	Lapeer	'84
Babbington, John	Corunna	'84
Bachman, M. H.	Stanton	'83
Bailey, M. G.	Mackinac Island	'88
Bailey, John R.	Mackinac Island	'90
Baker, H. G.	Detroit (T. H. H. & Sons)	'88
Baker, W. H.	Whitehall	'85
Baldwin, E. L.	Ludington	'84
Ballard, Edwin	Saginaw, W. S.	'90
Bangs, W. Z.	Holland	'85
Banister, George E.	Utica	'89
Barber, M. A.	Petoskey	'87
Barker, W. J.	Mt. Pleasant	'86
Barle, H. L.	Detroit	'87
Barrister, J. L.	Saginaw, E S.	'90
Barry, Frank	Rodney, Mecosta Co.	'88
Barrows, J. F.	Lawrence	'85
Bartram, E. W.	Paw Paw	'83

		ELECTED.
Bassett, A.	Detroit, 95 Woodward Ave.	'84
Bassett, J. A.	Detroit, (J. E. Davis & Co.)	'85
Bauer, A. C.	Grand Rapids	'84
Beach, L. T.	Bay City	'84
Beachum, C. B.	Romeo	'84
Beaman, G. W.	East Jordan	'86
Beckwith, R G.	Bradley	'88
Beebe, George C.	Bay City	'90
Beeden, Bert N.	Detroit, (J. E. D. & Co.)	'89
Bell, John	Lexington	'88
Belsher, W. E.	East Saginaw	'84
Bennett, J. R.	Menominee	'84
Bennett, C. W.	Quincy	'88
Berridge, Charles S.	Orion	'90
Bertram, J. P.	Westphalia	'83
Bigelow, W. H.	Owosso	'84
Bird, C. E.	Saugatuck	'84
Bird, Charles A.	Detroit, 324 6th St.	'88
Birge, W. E.	Kalamazoo,	'84
Black, Josiah	Detroit, 1115 Russell St.	'88
Blatchley, C. H.	Manistee	'88
Black, J. R.	Detroit, 51 Park Place	'88
Blackmer, H. A.	Charlotte	'84
Blair, C. A.	Morenci	'85
Bliss, Lyman W.	Saginaw	'90
Boden, E. T.	West Bay City	'90
Boehnlein, George	Detroit, (W., S. & B.)	'86
Bogart, F. E.	Detroit	'90
Bolio, E. William	Detroit, 97 Div. Ave.	'88
Booth, J. R.	Detroit, (P., D. & Co)	'88
Bostick, J. C.	Manton	'87
Boynton, O. C.	St. Ignace	'90
Botsford, E. S.	Dorr	'86
Bower, J. E.	Crystal Falls	'87
Brackett, F. E.	Cheboygan	'87
Braden, C. F.	Lake View	'90
Breitenbach, A. P.	Detroit, 99 Elizabeth St.	'89
Bricker, C. E.	Port Huron	88
Bridgeman, M. L.	Menominee	'84
Briggs, J. W.	Schoolcraft	'88
Bristol, F. E.	Lapeer	'84
Bristol, U. D.	Lapeer	'84
Brooks, A. S.	Detroit (W., S. & B.)	'90
Bross, C. M.	Jerome	'89
Brown, D. D.	Kalamazoo	'85

		ELECTED.
Brown, H. J.	Ann Arbor	'83
Brown, J. J.	Okemos	'83
Brown, W. J.	Detroit	'88
Brundage, Fred	Muskegon	'86
Bruske, R.	East Saginaw	'85
Buchanan, B. F.	Harrisville	'83
Buchanan, B. S.	Detroit, 133 Woodward Ave.	'88
Buckham, A. J.	Flint	'90
Bugbee, C. A.	Cheboygan	'85
Bullard, E. A.	Vassar	'83
Bullock, J. W.	New Lothrop	'88
Burdick, H. H.	Bay City	'84
Burley, D. H.	Port Huron	'90
Burroughs, C. S	Clinton	'84
Burwell, R. G.	Fort Gratiot	'84
Cady, G. F.	Hart	'83
Caldwell, G. G.	Centreville	'85
Caldwell, J. W.	Detroit, 242 G'd River Ave.	'84
Calkins, S. B.	Charlevoix	'85
Calkins, E. E.	Ann Arbor	'88
Campbell, Robert A.	Port Huron	'88
Campbell, George	Grand Ledge	'88
Campbell, J. E.	Detroit, 477 G'd River Ave.	'88
Carney, M. S.	Decatur	'85
Carpenter, A. D.	Cadillac	'85
Carrier, Hubert	Bay City	'84
Caulkins, Frank D	Flint	'88
Chamberlain, G. T.	Hartford	'83
Chamberlain, M.	Horton	'84
Champney, W. R.	Detroit, 27 Lafayette Ave.	'83
Chandler, C. A.	Cambria Mills	'84
Chester, E. F.	Cedar Springs	'88
Church, H. M.	Holly	'84
Church, Wm. D.	Detroit, (P., D. & Co.)	'89
Clark, A. G.	White Cloud	'83
Clark, S. B	Flint	'90
Clark, J. K.	Blissfield	'84
Clark, H. C	Detroit	'88
Clark, Arthur B.	Gobleville	'89
Claxton, W. C.	Calgary Alberta, N. W. T., Can	'85
Cleland, Henry	Detroit, 79 Montcalm St. W.	'85
Close, Orrin E.	Spring Lake	'87
Coe, T. D.	Romeo	'84
Cohoe, Adolph	Capac	'90

		ELECTED.
Collins, John B.	Frankfort	'88
Collins, A. B.	Charlotte	'89
Coleman, G. E.	Elk Rapids	'85
Colman, H. G.	Kalamazoo	'84
Colwell, C. B.	Jackson	'86
Conrad, J. F.	Otsego	'86
Conway, V. R.	Sault Ste. Marie	'85
Cook, C. E.	Bay City, 912 Van Buren St.	'84
Cooper, D. M.	Detroit, 371 Woodward Ave.	'84
Cooper, I. S.	Cheboygan	'85
Cornell, E. A.	Elkton	'85
Cornell, Aaron	Elkton	'90
Cosford, J. W.	Mancelona	'87
Craft, C. H.	Flint	'90
Crane, George W.	Cheboygan	'86
Crawford, J. B.	Detroit, (L. & L.)	'85
Crawford, Walter	Milford	'88
Crawford, Cornelius	Grand Rapids	'88
Cress, Edward H.	Minden City	'90
Crispe, John	Plainwell	'86
Croman, Joseph M.	Detroit, 291 Woodward Ave.	'89
Cross, F. E.	Grand Rapids, 453 Div. St	'85
Crouter, J. W.	Charlevoix	'83
Crowley, J. J.	Detroit, 421 Michigan Ave.	'84
Culver, R. W.	South Haven	'86
Cummer, R. J.	Cleveland, Ohio	'84
Curran, E. S.	St. Joseph	'83
Currie, A. A.	St. Clair	'85
Curtis, C. A.	Petoskey	'85
Curtis, J. B. F.	New Lothrop	'88
Curtis, F. E.	Napoleon	'85
Curtis, W. H.	Saginaw	'90
Cushman, H. D.	Three Rivers	'84
Cutler, W. R.	Ionia	'83
Damon, J. A.	Millington	'84
Darling, G. S.	Tawas City	'88
Davis, T. W.	Detroit, 308 Woodward Ave.	'88
Davis, F. C.	Vassar	'88
Davis, G. S	Detroit	'88
Davis, R. P.	Colorado Springs, Col.	'86
Davis, James E.	Detroit, 29 to 37 Larned, W.	'84
Dayton, A. J.	Grand Rapids	'87
Dean, H. M.	Niles	'87
DeBoe, John	Grand Rapids	'84

		ELECTED.
DeForrest, George G	Detroit, 874 Woodward Ave.	'90
Demorest, C. S.	Detroit, 153 G'd River Ave.	'88
Dennis, G. C.	Rochester	'88
De Puy, C. E.	Stockbridge	'88
Dewey, C. C.	Napoleon	'85
Dewitt, P. A.	Spring Lake	'88
Dickinson, O. B.	Grand Rapids	'84
Dillon, James E	East Tawas	'87
Dimick, S. H.	Ypsilanti	'84
Dodd, I. LeRoy H.	Buchanan	'83
Dodds, J. J.	Detroit, 51 and 53 Shelby St.	'83
Dodge, E. L.	Montague	'85
Dolson, Harry	Saginaw	'90
Dorman, Charles	Elkton	'90
Dorrance, A. A.	Coldwater	'83
Dorr, F. W.	Manchester	'88
Dunbar, R. H.	Parma	'85
Dullam, John C.	Flint	'90
Dullam, Frank	Flint	'90
Dunlap, Thomas	South Lyon	'84
Dunlop, J. W.	Clare	'88
Dunond, G. W.	Tuscola	'90
Dupont, Wm.	Detroit, 182 Michigan Ave.	'83
Eaton, H. H.	Boyne Falls	'87
Eberbach, O.	Ann Arbor	'88
Eberbach, Wm. F.	Ann Arbor	'89
Eckerman, A.	Muskegon	'84
Eiffraudt, Henry	Negaunee	'90
Eldred, B. C.	Chesaning	'85
Elliott, R. H.	Pontiac	'85
Empey, M. C.	South Bay City	'84
Emster, F. H. J. van	Bay City	'85
Erwin, M. J.	Harbor Springs	'87
Ester, Charles K.	Grand Haven	'88
Fairchild, H. B.	Grand Rapids	'86
Farrand, J. S.	Detroit	'84
Farrand, J. S., Jr.	Detroit	'88
Fasquelle, L. J.	Petoskey	'85
Faunckboner, O. A.	Douglas	'90
Fay, O. J.	Carlton	'88
Fellows, C. A.	———	'84
Fenton, A. W.	Baily	'86
Fenton, George L	Kingsley	'85

		ELECTED.
Fildew, A. S.	St. Johns	'84
Fincher, F. W.	Pentwater	'83
Fisher, James	Marlette	'87
Fisk, C. A. E.	Mancelona	'85
Foote, C. E.	Jackson	'86
Foot, Wm. H.	Saginaw, E. S.	'84
Fordham, M.	Elmira	'85
Fordham, W. W.	Elmira	'84
Foster, W.	East Tawas	'84
Foster, A. W.	Benton Harbor	'90
Fournier, Lucien	Bay City	'84
Fox, J. R.	Cedar Springs	'86
Francis, A. B.	Jackson	'87
Frantz, Charles H.	Saginaw, E. S.	'90
French, C. S.	Hillsdale	'88
Frenzel, G. S.	Mayville	'89
Fritz, T. H.	Cass City	'85
Frizelle, C. L.	Detroit, 26 Michigan Ave.	'84
Fuller, F. R.	Newberry	'90
Gallagher, E. W.	Saginaw, E. S.	'90
Gardner, A. R.	Fowlerville	'84
Garrigues, Edwin B.	Philadelphia, Pa., 410 Race St.	'89
Gates, T. O.	East Tawas	'84
Gerow, J. E.	Ovid	'83
Gibb, John A.	Kalamazoo	'87
Gill, W. J.	Beacon	'84
Gladding, B. O.	Constantine	'83
Gladwin, H. L.	Merrill	'88
Glazier, F. P.	Chelsea	'85
Gleason, E. G.	Richmond	'84
Glover, J. H.	Detroit, 120 W. Congress	'88
Goldsmith, G. S.	Manistee	'85
Goodrich, L. C.	Kalkaska	'83
Goodrich, L. A.	Hillsdale	'84
Goodsill, A. A.	Jasper	'84
Goodwin, S.	Detroit, 462 Jos. Campau Ave.	'88
Gould, Otis	Henderson	'88
Goyer, G. H.	Leaton	'84
Graybill, M. A.	Port Huron	'90
Grandy, Francis	Fairfield	'85
Grandy, M. A.	Sault Ste. Marie	'87
Greenthal, Julius	Detroit, 986 Michigan Ave.	'88
Green, Charles H.	Detroit, 711 Woodward Ave.	'89
Griffith, W. F.	Howell	'83

		ELECTED.
Griggs, S. A.	Detroit, 81 Woodward Ave.	'88
Gross, W. F.	Sault Ste. Marie	'85
Grossman, Wm.	Saginaw, W. S.	'90
Grunow, O. H.	Detroit, 182 Gratiot Ave.	'84
Gundrum, George	Ionia	'88
Haan, G. T.	Grand Rapids	'84
Hackett, P. E.	Wolverine	'86
Haeussler, G. J.	Manchester	'85
Hagerman, F.	Birmingham	'86
Haight, A. L.	Woodland	'86
Haines, E J.	Sandusky, Ohio	'90
Hale, H. G.	Nashville	'88
Hall, W. A.	Greenville	'84
Hall, Geo. C.	Detroit, 767 Larned St., E.	'88
Hallock, D. S.	Detroit, 764 Fort St., West	'84
Hamilton, E A.	White Pigeon	'86
Hamilton, H. G.	East Saginaw	'84
Hamlen, R. J.	Detroit, 813 Gratiot Ave.	'85
Hanlon, Amos	Elk Rapids	'84
Happy, Charles	Maybee	'85
Harmon, George P.	Mackinaw City	'88
Harper, J. C.	Milan	'84
Harris, J. M.	Ironton	'87
Harrison, B. D.	Barron, Wis.	'85
Harrison, D. A.	Paw Paw	'84
Harrison, H. E.	Richmond	'84
Harshaw, W. D.	Pontiac	'85
Harvey, S. K.	Detroit, 232 4th St.	'84
Harwood, G. M.	Petoskey	'84
Harwood, Henry	Ishpeming	'85
Hastings, R. A.	Sparta	'84
Hawkins, A. H.	Clayton	'88
Haynes, D. O.	Detroit, 835 Jefferson Ave.	'86
Hazeltine, A. F.	Grand Rapids	'86
Heath, Fred	Muskegon	'84
Heimbach, S. J.	Constantine	'84
Hennes, Wm. T.	Bay City	'90
Hessler, Will	Grand Rapids, 17 W. Bridge St.	'84
Hess, F. P.	Detroit, 453 G'd River Ave.	'88
Hewett, J. S.	Milford	'84
Heysett, Wm.	Ludington	'85
Hibbard, Frank	East Saginaw	'84
Hicks, W. H.	Morley	'88
Hinchman, Theo. H.	Detroit, 76 Jefferson Ave.	'88

		ELECTED.
Hinchman, J. M.	Detroit, 76 Jefferson Ave.	'88
Hinchman, C. C.	Detroit, (T. H. H & Sons)	'85
Hinds, E. J.	Midland	'86
Hisner, H. C.	Detroit, cor. Woodbridge and 3d	'88
Hodges, F. A.	Parma	'88
Hogeboom, J. G.	Saginaw	'84
Holland, M., Dr.	Edwardsburg	'90
Hollister, C. E.	Detroit, 503 Michigan Ave.	'88
Holt, A. E.	Detroit	'85
Holton, S. M.	Battle Creek	'90
Hopkins, I. F.	Muskegon	'84
Hopkins, F. S.	Benton Harbor	'88
Horner, D. A.	Caro	'84
Hotchkiss, F.	Hastings	'84
Hower, Nelson	Mendon	'85
Hubert, J. H.	Saginaw, E. S	'90
Hudnutt, F. O.	Hanover	'88
Hueber, C. F.	Port Huron	'88
Hueston, G. C.	Northville	'85
Hull, C. W.	Bay City	'87
Humburg, Fred'k	Detroit, 934 Gratiot Ave.	'88
Humeston, Bishop	Jackson	'90
Hunt, A. O	St. Johns	'85
Hunt, Dewitt H.	St. Johns	'88
Hurd, A. E.	Davison Station	'84
Hurd, C. W.	Davison Station	'85
Hurd, J. E.	Detroit, 208 Woodward Ave.	'84
Hutchings, Wm	Leslie	'84
Hutchins, Lee M.	Detroit, 511 4th St.	'90
Hutton, R. J.	Detroit, 425 Antoine St.	'85
Huyck, E. E.	Clio	'88
Hyde, A. O.	Marshall	'83
Hynes, Quincy	Hastings	'85
Inglis, Frank	Detroit, 177 Griswold St	'83
Ingram, E. J.	Iron Mountain	'83
Jack, George T.	Detroit, W. S. & B.	'90
Jackman, W. F.	Detroit, 287 Michigan Ave.	'88
Jacobs, Henry, Jr	Constantine	'90
Jamison, T. A.	South Boardman	'86
Jebb, Edward R.	Climax	'89
Jesson, Jacob	Muskegon	'83
Johnson, J. G.	Traverse City	'84
Johnson, Wm. C.	Detroit, 120 W. Congress St.	'88

		ELECTED.
Johnston, Wm., Jr.	Detroit, 121 Jefferson Ave.	'88
Johnson, O. C.	Ann Arbor	'84
Johnston, A. J.	Detroit, 271 Gratiot Ave.	'85
Johnston, W. S.	Detroit, 271 Gratiot Ave.	'84
Johnson, S. A.	Oden Centre	'90
Jones, Frank E.	Saginaw	'90
Jones, Shelby B.	Greenville	'90
Jones, M. A.	Big Rapids	'88
Judson, F. E.	Brighton	'88
Junker, Henry	Colon	'88
Kay, G. A.	Detroit, 81 Woodward Ave.	'85
Keeler, W. H.	Saginaw	'83
Kellogg, C. E	Grand Rapids	'87
Kelly, F. H.	Au Sable	'84
Kelsey, F. E.	Ionia	'86
Kemink, Theo.	Grand Rapids, 81 W. Leonard St.	'84
Kennedy, T. B.	Commerce	'86
Kennedy, E. J.	Detroit, 709 Woodward Ave.	'84
Kenyon, W. W.	Howell	'84
Kentz, Carrie B.	Carleton	'90
Kephart, H.	Berrien Springs	'88
Kephart, W.	Berrien Springs	'84
Kerr, Wm.	Detroit, (J. E. D. & Co.)	'88
Kestell, J. R	Detroit, 695 Beaubien St.	'87
Kimball, J. L.	Crystal Falls	'84
Kinmont, B. F.	Tekonsha	'84
Kinsley, John	Manistee	'89
Kirby, Clarence D.	Leslie	'90
Kirkwood, C. H.	Ishpeming	'84
Kirkwood, P. B.	Negaunee	'85
Kirtland, J. W.	Lakeview	'85
Klingman, Theophil	Dexter	'85
Knill, H. C., Jr.	Port Huron	'88
Koon, C. S.	Muskegon	'85
Kremer, Charles F.	Saginaw, E. S.	'90
La Croix, Jos. J.	Bay City	'90
Lane, I. D.	Sand Beach	'84
Langenman, F. E.	Saginaw, W. S.	'90
La Rue, C. M	West Bay City	'85
Lambert, B. L.	Detroit, 185 Jefferson Ave.	'84
Latimer, F. N.	Ludington	'83
Laubengayer, T. A.	Owosso	'84
Law, W. J., Dr.	Leroy	'89

		ELECTED.
Leasia, J. N.	Williamston	'85
Lee, John, M. D.	Dexter	'83
Leland, N. P.	Gaines	'86
Lents, Theodore	Detroit, Campbell Ave.	'85
Lever, Henry	Newaygo	'84
Leyerer, George S.	Bay City	'90
L'Hommedieu, F. C.	Detroit, 95 Woodward Ave.	'88
Litchfield, E. C.	Flint	'85
Little, A. F.	Aarwood	'85
Locher, H. E.	Grand Rapids	'85
Lohnsbury, A. D.	Midland City	'90
Longwell, H. D.	Paw Paw	'85
Longsbury, P. M.	Reed City	'85
Lowman, Oscar, Dr.	Detroit, 185 Jefferson Ave.	'89
Luce, Jr., W. O.	Caro	'85
Lunn, G. D.	Edmore	'85
Lusk, George L.	West Bay City	'86
Lyman, A. H.	Manistee	'83
Lyons, A. B.	Honolulu, S. I.	'84
Mason, J. F.	Warren	'88
Matthews, J. J.	East Tawas	'88
Magdeleney, August	Detroit, Hubbard Ave.	'88
Mann, F. C.	Detroit, 20 Monroe Ave.	'88
MacKimmie, J. D.	Detroit, 28 Jefferson Ave.	'88
Madill, Thomas	Detroit, 120 Henry St.	'84
Malmgren, Gustav A.	Iron Mountain	'87
Mann, Albert	Ann Arbor	'83
Mandigo, Della	Sherwood	'86
Mandigo, W. R.	Sherwood	'84
Mason, C. A.	Flint	'85
Mason, G. B.	Saline	'83
Martin, A. F.	Imlay City	'84
Martin, C. L.	Elk Rapids	'84
Martin, Henry	Jackson	'84
Martin, Susie A.	Hopkins Station	'85
Martty, F. O.	Ann Arbor	'87
Mayer, F. W.	Sebawaing	'84
Maxson, M. M.	Hudson	'85
McCollough, Edward	Detroit, (cf F. D. Stevens)	'90
McMillan, W. R.	Detroit, (J. E. D. & Co.)	'90
McDonald, David	Kalamazoo	'84
McDonald, D. T.	Red Jacket	'83
McDonald, George	Kalamazoo	'83
McDonald, Murdo	St. Johns	'85

		ELECTED.
Roeser, O. W.	Saginaw, W. S.	'90
Rogers, LeRoy	Irving	'86
Rogers, T. F.	Lakeview	'87
Rogers, A.	Ravenna	'88
Rogers, Arthur S.	Vassar	'89
Ross, E. W.	Detroit, 418 Cass Ave.	'83
Roussin, V.	Ludington	'84
Royer, Jr., Theo.	Piqua, O.	'84
Ruchty, Louis	Detroit, 410 G'd River Ave.	'84
Ruddiman, Edsel A.	Detroit, 116 Jefferson Ave.	'89
Rudolphi, A. E.	Dowagiac	'86
Rundel, J.	Holton	'86
Runner, J. W.	Shelby	'86
Rushmore, W.	Elk Rapids	'86
Russell, E. E.	Jackson	'90
Sabin, C. E.	Centerville	'83
Sackett, S. M.	Monroe	'83
Safford, O. P.	Flint	'83
Sanford, Frank A.	Grand Rapids (White & Co.)	'89
Sawyer, R. J.	Menominee	'83
Sayers, J. A.	Seney	'85
Schaefer, Wm.	Carleton	'85
Schlotterbeck, J. O.	Ann Arbor	'90
Schulz, L. S.	St. Joseph	'85
Schumacher, A. B.	Grand Ledge	'84
Schumacher, A. C.	Ann Arbor	'87
Schumacher, D. A.	Manistique	'84
Schott, A. A.	East Saginaw	'88
Scott, H. J.	Seney	'90
Scoville, G. R.	Manistee	'84
Seeley, C. A.	Lansing	'88
Selleck, R. W.	Flint	'90
Seibert, G. F.	Iron Mountain	'83
Shaffer, John M.	Gladwin	'89
Sheffield, W. E.	Benton Harbor	'84
Sherling, F. W.	Grand Rapids	'85
Sherlock, T. J.	Stetson, Oceana Co.	'85
Sherwood, C. L.	Dowagiac	'84
Shook, D. L.	Coral	'84
Sigler, F. A.	Pinckney	'85
Simoneau, Leander	Saginaw, E. S.	'90
Simoneau, R. F.	Saginaw, E. S.	'90
Slawson, W. W.	Greenville	'86
Sloan, E. E.	Bancroft	'85

		ELECTED.
Pike, N.	Morley	'86
Piper, Fred H.	Lansing, 717 Ionia St.	'89
Pitcher, Sheldon	Detroit, 450 Fourth Ave.	'84
Platts, Randolph	Port Sanilac	'84
Plessner, Fred	West Bay City	'88
Poole, C. A.	Detroit, 647 Third Ave.	'88
Potter, H. W.	Jenisonville	'87
Powell, A. H.	Gladstone	'90
Power, J. O.	Addison	'84
Prall, D. E.	East Saginaw	'83
Pratt, G. O.	Detroit, 723 Antoine St.	'84
Pratt, Stephen	Howell	'85
Prescott, A. B.	Ann Arbor	'83
Preston, T. W.	Milbrook	'86
Price, O. J.	Detroit, 485 14th Ave.	'83
Purvis, G. A.	Detroit, 983 Jefferson Ave.	'85
Putnam, A. S.	Manistique	'88
Raider, J. F. A.	Newaygo	'83
Raizon, James	Wakefield	'88
Randolph, A. M.	Northville	'83
Ray, G. C.	West Bay City (Banks)	'85
Raymo, Owen	Wayne	'88
Redmond, J. A.	Sandusky	'88
Reidy, Mike	Corunna	'84
Revell, Samuel	Roscommon	'88
Reynolds, W. B	Eaton Rapids	'83
Reynolds, L. E	Adrian	'90
Rice, C. E.	St. Clair	'88
Rich, J. W.	Manistee	'85
Richards, F. P.	Detroit, 204 Jos. Campau Ave.	'85
Richards, T. H.	Detroit, 780 Jefferson Ave.	'84
Richmond, T. W.	Bear Lake	'88
Ringler, Eugene	Saginaw	'84
Ripley, L. G.	Montague	'84
Roberts, D. O.	Kalamazoo	'87
Robertson, B. J.	Breedsville	'84
Robinson, E. H.	Montreal, 81 St. Matthews St.	'88
Robinson, O. H.	Grand Rapids, 115 Chestnut St.	'88
Robinson, Wm. H.	Detroit, Fort St. W.	'88
Roche, W. J.	Lake City	'84
Rodenbaugh, H. W.	Breedsville	'87
Rodenbaugh, I. N.	Mancelona	'86
Rodenbaugh, O. L.	Mancelona	'85
Rodgers, E. J.	Port Huron	'84

		ELECTED.
Newell, C. P.	Flushing	'84
Niver, W. H.	Chesaning	'88
Norton, J. T.	Rochester	'88
Noel, Gideon	Good Hart, Emmet Co.	'84
Northrup, B D.	North Lansing	'83
Nutt, E. C.	Cheboygan	'90
O'Brien, J. R.	Detroit, 297 First St.	'85
Orr, J. J.	Tecumseh	'84
Orth, L. P.	Traverse City	'86
Osborne, G. A.	Luther	'87
Owen, W. H.	Maple Rapids	'86
Packard, H. H.	Cheboygan	'90
Palmer, Henry	St. Johns	'89
Palmer, B. W.	Detroit, 836 Jefferson Ave.	'88
Parker, A. S.	Detroit, 747 Woodward Ave.	'83
Parker, G. J.	Port Huron	'83
Parker, O. J.	Howell	'86
Parkill, C. P.	Owosso	'83
Parkill, S. E.	Owosso	'83
Parkinson, E. A.	Traverse City	'85
Parsons, Charles W.	Detroit, (*Era*)	'90
Paquette, F. D.	Ludington	'83
Passage, J. H.	Greenville	'86
Patenaude, A.	Norway	'87
Patterson, B. M.	———	'85
Pauly, L.	St. Ignace	'87
Peck, A. W	Grand Rapids	'83
Peck, J. E.	Grand Rapids	'85
Peckham, H. C.	Freeport	'85
Pegg, H. D.	Morenci	'84
Penberthy, Edward	Iron River	'87
Perham, Jason	Kent	'88
Perkins, T. W.	Detroit, 333 Woodward Ave.	'88
Pettit, Charles E.	Bad Axe	'90
Perry, D. B	West Bay City	'83
Perry, F. W. R.	Detroit, 709 Woodward Ave.	'83
Pfeiffer, G. J. O	Detroit, 527 Jefferson Ave.	'88
Phelps, L. A.	Saugatuck	'88
Phillips, H. S.	Middleton	'88
Phillips, E. F.	Armada	'83
Phillips, F. S.	Ogden	'84
Phillips, W. R.	Battle Creek	'83
Pierson, L. R.	Kalamazoo	'88

		ELECTED.
McEvoy, J. E	Manistee	'85
McFarland, A.	Detroit, 693 Michigan Ave.	'83
McHenry, G. A.	Chippewa Lake	'86
McKenna, J. D.	Shepherd	'84
McKibbin, R. S	Detroit, 322 Fort St. W.	'88
McMillan, Neal	Rockford	'87
McMullen, G. H.	Ionia	'83
McMurtie, Fred. J.	Three Rivers	'89
McPhee, J. A.	Lake City	'87
Mead, H. L.	Escanaba	'84
Mead, J. N.	Escanaba	'83
Meigs, M. I.	Cambers	'88
Mills, T. H.	Port Huron	'88
Merrell, F. P.	Ithaca	'83
Merrill, A. C.	Cross Village	'87
Merriam, C. K.	Ludington	'83
Merriam, Charles H.	Jackson	'90
Messeroll, D. C.	Jackson	'84
Mesick, H. J	Plainwell	'86
Meyers, John	Mt. Clemens	'83
Miller, H. J	Fort Gratiot	'85
Miller, A. T.	Swartz Creek	'90
Millikin, T. J.	St. Clair	'84
Millington, F. S	Paw Paw	'83
Mills, L. M.	Grand Rapids	'86
Millspaugh, M. B.	Grand Rapids	'90
Moeller, Jos. C.	Detroit, 74 Jay St.	'89
Moore, John	Ann Arbor	'84
Moore, W. B.	East Saginaw	'84
Moore, L. G.	Saginaw, W. S.	'90
Mooreland, Charles	Hadley	'85
Morford, A. D.	Ypsilanti	'84
Morrison, A. W.	Constantine	'85
Morris, H. M.	Detroit, 919 G'd River Ave.	'88
Morris, S. S.	Pinconning	'88
Mottram, J. H. H.	Detroit	'83
Muir, J. D.	Grand Rapids	'86
Mulloy, Wm.	Minden	'84
Murphy, J. W.	Battle Creek	'83
Myers, A. W.	Gobleville	'84
Myers, Theo. W.	Saginaw	'90
Nash, C. P.	Detroit, (T. H. H. & Sons)	'88
Nasmyth, P. F.	Detroit, 388 Baker St.	'88
Nelson, E. H.	Detroit	'84

		ELECTED.
Smallidge, Frank E.	Detroit, Jefferson Ave.	'89
Smith, A. B.	Trenton	'84
Smith, A. L.	Crystal	'86
Smith, C. M.	Clarkston	'88
Smith, Harvey W., Dr.	St. Ignace	'90
Smith, Fletcher	Saginaw	'88
Smith, Oscar W.	Detroit, (P. D. & Co.)	'89
Smythe, Wm. J.	Detroit, (P. D. & Co.)	'90
Snodgrass, S. K.	———	'88
Snow, H. W.	Detroit, (F. Stearns & Co.)	'85
Snyder, Walter C.	Horton	'90
Soule, C. A.	Eaton Rapids	'84
Shaulsburg, Duane	Three Rivers	'90
Spayde, W. H.	Bloomingdale	'86
Spencer, J. L.	Linden	'88
Spencer, M. Ella	Linden	'84
Spofford, R. J.	Bay City	'90
Sprague, W. G.	Flushing	'88
Stafford, Jos.	Newberry	'90
Stafford, E. O.	Marquette	'90
Stanley, C. D.	One Rama	'88
Stanton, H. N.	Sheridan	'85
Stanton, M. B.	Sheridan	'85
Starr, George E.	Plainwell	'87
Stearns, Fred	Detroit	'84
Steele, Michael	Ionia	'85
Steketee, A. G.	Grand Rapids	'85
Steketee, G. G.	Grand Rapids	'85
Steiger, E. A.	Detroit, 714 Rivard St.	'88
Steinkohl, Frederick	Manchester	'89
Stevens, A. B.	Ann Arbor	'83
Stevens, C. R.	Northville	'83
Stevens, F. D.	Detroit, 133 Woodward Ave	'83
Stiner, James W.	Unionville	'90
Stone, C. G.	Detroit, 580 Lafayette Ave.	'84
Stover, H. E.	Kalkaska	'86
Strachan, J. D.	Muir	'88
Stringer, G. W.	Detroit, 898 Michigan Ave	'84
Stringham, Wm. T.	Shelby	'88
Swaby, G. A.	West Bay City	'85
Swayze, E. S.	Otisville	'88
Sweet, B. F.	Carson City	'85
Sweetser, F. E.	Port Huron	'88
Swift, George	Detroit, 7 Griswold St.	'83

		ELECTED.
Tappan, George C.	Vassar	'90
Taylor, C W.	Loomis	'85
Taylor, E. J.	Vassar	'64
Taylor, H. S.	Detroit, 54 Selden Ave	'89
Tepoorten, F. A.	Bay City	'90
Terrill, B. E.	Muir	'86
Thayer, A. R.	Saginaw, E. S.	'90
Thompson, M. L.	Chalkanie, Oregon	'88
Thompson, A. L.	Plainwell	'87
Thompson, Frank A.	Detroit, (P. D. & Co.)	'89
Thum, Hugo	Grand Rapids	'84
Tibbs, W. H.	Grand Rapids	'86
Tillitson, W. J.	Lainsburg	'86
Tillson, Fred. P.	Ishpeming	'87
Tilton, B. E.	Bay City	'85
Tobey, N. I.	Sturgis	'84
Todd, A. M.	Nottawa	'87
Todd, F. J.	Detroit, (J. E. D. & Co.)	'86
Tomlinson, W. A.	Au Sable	'84
Torontaly, Paul	East Tawas	'85
Towlinson, A. E.	Saginaw, W. S.	'90
Travis, F. A.	St. Johns	'85
Treat, A. B.	Adrian	'84
Tredwell, J. H.	Detroit, 51 Shelby St.	'85
Trombly, C. K.	Detroit, 594 Gratiot Ave.	'88
Tubbs, C. C.	Chesaning	'83
Tullgren, A.	Iron Mountain	'86
Tupper, F. L.	Meredith	'85
Turner, R., Dr.	Flat Rock	'86
Tuttle, W. A.	Grand Ledge	'83
Van Boemble, F. H.	Bay City	'90
Van Bochove, R	Grand Rapids	'86
Vandecar, J. H.	North Branch	'83
Van Liew, V. C.	Vestaburg	'90
Van Slype, N. F. L.	Detroit, 255 St. Aubin Ave.	'88
Van Wickle, F. W.	Sheely	'88
Van Leeuwen, W. H.	Grand Rapids	'85
Van Marter, Ezra	Jackson	'84
Van Vranken, G. D.	Cadillac	'85
Varnum, E. C.	Jonesville	'84
Varnum, G. C.	Jonesville	'84
Vaughan, Wm. H.	Oscoda	'90
Vaughan, B. D.	Bellevue	'84
Vedder, E. H.	West Bay City	'85

		ELECTED.
Veitch, Arthur	Mayville	'90
Vennema, H. A.	Menominee	'85
Vernor, James	Detroit, 235 Woodward Ave.	'84
Vining, Cary W.	Lakeview	'89
Wagener, C. H.	Big Rapids	'83
Wagner, A.	Eastmanville	'86
Waite, G. W.	Coldwater	'84
Wait, S. E.	Traverse City	'84
Waldorf, A.	Detroit, 838 Michigan Ave.	'88
Walker, W. K.	Lansing	'83
Walker, A. L.	Detroit, 415 Woodward Ave.	'88
Walsh, Heber	Holland	'85
Walthausen, G. L. F. von	Bay City	'85
Walthausen, Werner von	Bay City	'84
Waples, Grafton	Detroit, 930 Michigan Ave.	'84
Ward, G. J.	St. Clair	'84
Ward, W. A.	Eau Claire	'84
Warne, F. C.	East Jordan	'86
Warner, S. H.	Marlette	'86
Warner, W. A.	Detroit, (T. H. H. & Sons)	'84
Warren, W. M.	Detroit, 525 Jefferson Ave.	'88
Watson, J. B.	Coopersville	'84
Wastele, Wm.	Port Huron	'88
Watson, R. A.	Detroit, 764 Fort St. W.	'88
Watz, H. G.	Saginaw	'84
Webb, B. S.	Alma	'86
Webb, H. J.	Cassopolis	'88
Webb, E. T.	Jackson	'85
Webber, A. H.	Big Rapids	'84
Weeks, A. A.	Grand Rapids, 256 Plainfield Ave.	'87
Weeks, James E.	Battle Creek	'89
Weeks, E. J.	Jackson	'90
Weise, H. L.	Detroit, 592 McDougall Ave.	'84
Weiss, J.	Monroe	'88
Wells, C. A.	Yale	'86
Wetzell, H. A.	Detroit, 821 Jefferson Ave.	'88
Wheeler, C. F.	Hubbardston	'84
Whelpley, B. I.	Hoytville	'84
Whipple, G. N.	Detroit, 222 Orleans St.	'85
White, L. T.	Eaton Rapids	'83
White, W. L.	Grand Rapids	'84
Whitton, R. L.	Burnep's Corners	'84
Wicker, C. D.	Coldwater	'83
Wiede, Henry	Reese	'83

		ELECTED.
Wiesinger, J. G.	Detroit, Cor. 12th and Baker	'84
Wiggins, A. H.	Lawrence	'85
Wilber, C. H.	St. Ignace	'87
Wilcox, George D.	Eaton Rapids	'89
Wilders, A. J.	Ortonville	'85
Wilder, E. P. B.	Oxford	'88
Wilkins, F. C.	Union City	'85
Willard, H. W.	Manistee	'85
Willard, Thomas	Bear Lake	'85
Willett, Frank, Dr.	Monroe	'88
Williams, H. M.	Mason	'85
Williams, W. C.	Detroit, (W. S. & B.)	'84
Williamson, G. E.	Vassar	'85
Williamson, John	Detroit, 81 Woodward Ave.	'84
Williams, R. P.	Detroit	'88
Williams, C. F.	Caledonia	'88
Williams, J. P.	Climax	'88
Wilson, E.	Stanwood	'87
Wilson, C. A.	Holly	'90
Wilson, E. R	Grand Rapids	'87
Wilson, G. A.	Charlevoix	'84
Wilson, W. B.	Detroit	'83
Windover, W. V.	Detroit, 1328 Woodward Ave.	'88
Witherspoon, G. A.	Chatham, Ontario	'85
Witherspoon, P. E.	Harrison	'85
Wolfinger, C. E.	Hopkins Station	'84
Wolf, Louis	Jackson	'90
Wood, Will H.	Sheridan	'87
Wood, Wm. A.	Six Lakes	'88
Woods, T. T.	Belleville	'85
Woods, C. H.	Detroit, 524 G'd River Ave.	'88
Woolsey, F. F.	Hartford	'84
Worcester, W. N.	Coldwater	'88
Wright, Charles	Detroit, 15 Jefferson Ave.	'83
Wright, C. A.	Tecumseh	'84
Wright, E. A.	Pentwater	'85
Wurzburg, F. J.	Grand Rapids	'84
Yates, H. W.	Big Rapids	'88
Yeomans, E. T.	Ionia	'83
Young, C. A.	Battle Creek	'84
Young, E. A.	Clio	'86
Young, S. E.	Lakeview	'88
Zahn, Jonathan A.	Detroit, 291 Woodward Ave.	'90
Zimmer, Wm. A.	Manistee	'88

Honorary Members.

		ELECTED.
Duffield, S. P., Ph. D., M. D.	Detroit	'87
Englehard, G. P.	Chicago, Ill.	'83
Stowell, Mrs. L. R., M. D.	Washington, D. C.	'87
Vaughan, V. C., Ph. D., M. D.	Ann Arbor	'87
Wrampelmeier, T. J., Ph. C.	San Diego, Cal.	'87
Wells, Frank	Lansing	'90

Resigned.

Osborne, W. E.,
Wells, Frank, (elected Hon. Mem.)
Palmer, B. W.,
Thompson, A. L.

Dropped 1890.

Adamson, J. W.,
Allen, E. F.,
Andrus, C. S.,
Baar, Henry,
Babel, C. W.,
Baier, C. G.,
Baker, Dennis,
Bassett, E. C.,
Baxter, T. A.,
Beck, W. H.,
Beebe, Homer,
Bennett, L. T. E.,
Bertram, Julius,
Bigg, A. H.,
Blakeslee, L. G.,
Bower, Manley,
Braddock, O. L.,
Browning, G. B.,
Cahalan, J. C.,
Cameron, Alexander,
Case, George N.,
Chapple, L. D.,
Coffin, C. L.,
Connell, F. G. L.,
Couturier, Noe
Deitz, G. A.,
Dunham, E. W.,
Everhart, James,
Fales, F. R.,
Fatin, C. A.,
Frank, H. A.,
Fulton, Robert,
Geary, S. M.,
Goodyear, W. H.,
Hallady, O. A.,
Harvey, T.,
Hewett, L. F.,
Higgins, D. W.,
Hogguer, F. F. W.,
Howard, Charles,
Howard, W. S.,
Kelly, A. F.,
Kidd, A. J.,
Lamoreux, John,
Lamoreux, Sarah A.,
Lenhard, C. A.,
Leuschner, Richard
Long, G. L.,
MacKimmie, J. A.,
McFarland, Wm.,
Nelson, P. P.,
Orr, E. N.,
Padley, W. A.,
Paige, L. E.,
Perren, George L.,
Phelps, L. E.,
Pinkerton, R. J.,
Pinckney, C. A.,
Preston, George,
Prittie, W. H.,
Purdy, H. D.,
Quick, J. B.,
Ribbins, J. J.,
Ross, W. H.,
Rumer, J. F.,
Schimmell, G. R.,
Sheldon, R. B.,
Snow, S. M.,
Stiles, T. P.,
Tibbits, A. H.,
Todd, W. F.,
Turner, D. D.,
Tweedale, J. R.,
Vanden Belt, N.,
Voller, J. H.,
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Woolford, R. S.

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WILLIAMSON, INGRAM & GRIGGS,

Pharmaceutical Chemists

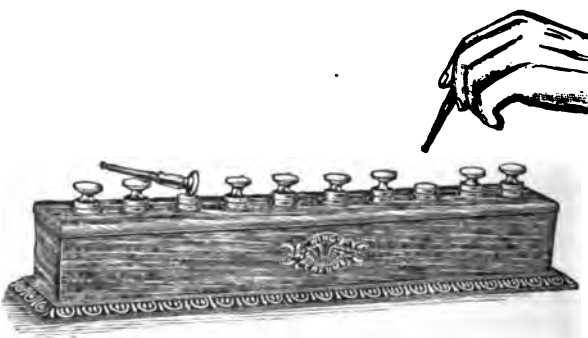
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WILLIAMSON, INGRAM & GRIGGS.

REFERENCES FOR THE REVISION.

An Index of Contributions from the Michigan State Pharmaceutical Association, and the School of Pharmacy of the University of Michigan. For Reference in the Revision of the Pharmacopœia, 1883: 1890.

ANN ARBOR COURIER PRINT.

PREFATORY.

THIS index is designed to give reference only to such published papers as may be of some service in meeting questions liable to arise in the work of the Revision. The offer of such an index is made, in the first place, because certain important contributions to the Michigan State Proceedings, especially those of voluminous tabular matter, did not appear in current periodicals of pharmacy, and were not given to the Digest of Criticisms, that most helpful key to current literature. Then it was thought best not to separate the papers of the School of Pharmacy, wherever published, from those of the State Association, as the two bodies have been closely allied in the work they have done for the Pharmacopœia. Beyond the reports from those two bodies, the papers of Michigan pharmacists are not included in this index. Among the contributions indexed, special mention may be made of the forty-five pages of tabulated specific gravities and expansion coefficients by Dr. A. B. Lyons, as well as his thirty-two pages of tabulated equivalents of weight and volume, loaded as these are with recalculations and new determinations, done in the author's well-known tireless industry. Another instance of literature not easily compassed by the journals is that of Mr. VanZwaluwenberg's useful Index of Methods of Opium Assay, filling eighteen pages. To favor the finding of articles in the nearest current literature, the year of publication is given next after the author's name, and reference to volume and page in one or more periodicals is given for every paper republished from the State proceedings, so far as known.

In the desire to be helpful to them, this little reference list is offered to the Committee of Revision, with an assurance of hearty confidence in their labors, and of loyalty to the code which lies in their hands.

ALBERT B. PRESCOTT.

ANN ARBOR, MICH., September, 1890.

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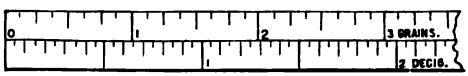
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OF THE

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Pharmaceutical Association,

AT ITS

NINTH ANNUAL MEETING,

HELD AT

ANN ARBOR,

October 20, 21 and 22.

1891.

ALSO, THE

CONSTITUTION AND BY-LAWS,

ROLL OF MEMBERS, ETC.

NEXT ANNUAL MEETING,

GRAND RAPIDS, AUG. 2, 3, 4,

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Blank applications for membership will be furnished by the Secretary upon request.

Attention is called to the change in Article II of the By-laws, whereby applicants for membership are elected by the Executive Committee.

PROCEEDINGS.

Extra copies of the proceedings can be obtained of the Secretary at fifty cents each.

N. B.—If you change your residence, if your name or address is incorrectly given in the Membership Roll, or if you learn of the death of a fellow member, please notify the Secretary at once.

The next annual meeting of the Association will be held in Grand Rapids, the exact date to be fixed upon later by the Executive Committee.

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PROCEEDINGS

OF THE

Michigan State Pharmaceutical Association.

MEETING HELD AT

Ann Arbor, October 20, 21 and 22, 1891.

FIRST SESSION.

The meeting was opened with prayer by the Rev. Mr. Bradshaw, and the Association was then welcomed to Ann Arbor in a brief address by William G. Doty, Mayor of Ann Arbor. On behalf of the Association President D. E. Prall briefly responded.

The President called Mr. James Vernor, third Vice-President, to the chair, following which he read his address, as follows:

PRESIDENT'S ADDRESS.

Fellow Members of the M. S. P. A.:

At the close of another year we meet to discuss the situation, to estimate the value of the results from our past efforts, and to plan the future. Since our last meeting we have passed through one of those perilous seasons, a session of the State Legislature. A bill known as the Downing Bill was introduced, the purpose of which was to allow the physicians to conduct pharmacies without passing an examination before the Board of Pharmacy. By the prompt action of our Committee on Legislation our Secretary was instructed to send to the members of the Association blank forms of remonstrance to be signed by reputable physicians, and these petitions were forwarded to Lansing, and this bill was defeated. The State Board of Pharmacy have met an obstacle to the prosecution of their work in a decision against their authority to employ their own attorney. It is claimed that the State Pharmacy Law is for the protection of the public. It is a fact that the expenses of carrying out its provisions are borne by the pharmacists, and it would seem but just that they be allowed out of the funds which they have contributed the amount necessary to enable the Board of Pharmacy to employ a competent attorney, as the effort to prosecute infringements through the various county prosecuting attorneys has proven impractical and ineffectual. I suggest that the Association memorialize the Legislature in favor of providing the Board of Pharmacy with the services of an attorney, who shall be an officer of the state and empowered to conduct prosecutions in any part of the state. Among the questions brought before us for discussion last year by the Committee on Trade Interests was the disposition existing among physicians in some places to purchase their supplies away from home and to dispense their own medicines. The remedy suggested by our Committee, that we cultivate a better acquaintance with the physicians and seek to save to ourselves their trade, I believe to be in the right direction, but the question is still an important one affecting our interests, as the agents of foreign supply houses are even now vigor-

ously canvassing among the physicians of our state for trade. Just as I believe that our union in this association is a material benefit to our business, so I believe that a closer alliance between this association and the representative association of physicians, the State Medical Society, would prove a mutual advantage. I note with pleasure that the State Medical Society have appointed three delegates to attend this meeting, and I trust their presence will be the beginning of a better acquaintance between these representative bodies. During the past few months the druggists of the whole country have been made the subjects of some very scurvy newspaper attacks, under the head of "Substitution," but as these newspaper articles bore evidence of the ignorance and cunning design of their authors, the refutation of the unjust censures they contained became an easy matter for the reputable pharmacist and the intelligent journalist who might be disposed to treat the subject fairly. And whatever of truth is contained in the charge of substitution brought against the druggist, we are willing to profit by, and I believe this episode will hasten our movement toward accomplishing that which our good intentions anticipate, but which pressure upon our time prevents, that is, the production in our own laboratories of as many as possible of the preparations which we offer for sale.

As we come to the question of prices on proprietary articles we find ourselves in a labyrinth of opinions almost as varied as the sources from which they are obtained. As the only sufferer from the present state of affairs is the retailer, it is within our province to continue the agitation of this price question until the remedy is found. The manufacturer and the wholesaler have an arrangement by which the wholesaler is protected in his profit. The retail druggist desires this protection extended to him, and while the difficulties in the way of organizing the retailers are great, we hope that if necessary the state associations will accomplish this very practical and desirable benefit. At the meeting of the American Pharmaceutical Association in New Orleans this matter was given to the consideration of a committee of ten. Upon this committee was a member of our Association, Mr. Arthur Bassett, of Detroit. This committee delegated the matter to a smaller committee of three, who were to formulate a plan. During the present month I received from Mr. Finlay, President of the American Pharmaceutical Association, the following letter.

NEW ORLEANS, Oct. 2nd, 1891.

Mr. D. E. Prall, Prest. Mich. State Pharm. Assn.:

DEAR SIR—The Council of the American Pharmaceutical Association has adopted the following resolution:

"*Resolved*, That acting in the interests of the commercial section of the A. P. A., the president of each State Pharmaceutical Association be invited by our president to appoint one person as a representative of his association to attend the meeting of the National Wholesale Druggists' Association, to be held the present month at Louisville, Ky."

I now address you with the view of carrying out the terms of this resolution.

The American Pharmaceutical Association will send a delegation consisting of five members to visit the N. W. D. A., and will present a plan to them, which, if adopted, will go far towards affording relief to the retail drug trade throughout the country, from the disastrous effects of price cutting in the sale of proprietary articles. The membership of the A. P. A. amounts to about 1,400. That of the State Associations combined numbers over 10,000, or nearly one-third of the pharmacists of the Union.

It is the firm conviction of those who have given the subject matter thought, that the united action of the State Associations, supplementing the efforts of the parent body, would carry out the contemplated plan.

The wholesale trade are in full accord with the movement, and it is fair to expect that over 95 per cent. of the retailers would gladly hail and adhere to its adoption.

The former can do nothing unless our share of the work be conscientiously and thoroughly performed.

When the plan is adopted, the "cutter" must go! Deprived of the

means of waging war against us, he must fall into line and himself enjoy the benefits of the new order of things.

Perhaps the members of your association have so far escaped the attack of the cutter. This does not prove that they will enjoy that immunity in time to come. Prevention is better than cure.

To consummate the object so much desired, I respectfully request that you send a delegate, empowered to act in concert with the committee of the A. P. A. in the matter of formulating and carrying out a plan, co-operating with the N. W. D. A. at its meeting, and that your representative shall arrive at the place of meeting (Louisville) not later than noon of the 19th inst.

Very respectfully,

ALEX. K. FINLAY, President A. P. A.

In obedience to this request I appointed, in addition to the delegates already appointed to represent this Association at the meeting of the N. W. D. A., Mr. Arthur Bassett. An active member of our Association. Mr. D. O. Haynes, of Detroit, has written letters to twenty-five of the leading manufacturers, asking them to agree upon some plan which each one would be willing to adopt. Certain manufacturers have now in operation plans for maintaining the regular prices on their preparations, and are conscientiously laboring to perfect the systems they have adopted. Upon one important fact we may congratulate ourselves. I refer to the character of the men who represent the different branches of our business. Personally, I have during the past year been made to feel acutely the loyalty of the wholesale houses to the interests of the retailer and the manufacturer, and I feel assured that whenever there is proposed a feasible plan for fair adjustment of the various questions which affect our welfare, the willing co-operation of the manufacturer, the wholesaler and the retailer will bring such a plan to a happy consummation. The scientific and ethical part of our work has certainly not been forgotten nor neglected. The suggestion has come to me recently that this Association should confine its attention more exclusively to ethical discussions, but how can we avoid giving a large part of our attention to the commercial questions which are so vital to our success? The pharmacist who loves his profession is not going to allow his success in merchandising to choke his aspirations and efforts toward a deeper insight into the mysteries of chemistry and the finer manipulations in pharmacy. On the contrary, I judge from my own experience of twenty-five years constant application that the greater my success financially the more pleasure will be encompassed in the opportunities thus afforded of conducting the highest class pharmacy which my means and advancing knowledge will secure. I thank this Association for the honor conferred upon me and for the patience which I anticipate you will accord my future services.

Mr. Vernor: You have heard the President's address. What is your pleasure regarding it?

Mr. Geo. Gundrum: I move that a committee be appointed to consider the recommendations contained in the President's address and report to the Association.

The motion prevailed, and the chairman appointed the following committee to carry out the resolution: Mr. Parsons of Detroit; Mr. Webb of Jackson; Mr. Reidy of Corunna.

The President then resumed the chair.

President: The next business in order is the Report of the Secretary of the State Board of Pharmacy.

Mr. Vernor, the Secretary of the State Board of Pharmacy, then read the report of the transactions of the Board of Pharmacy for the past year, as follows:

REPORT MICHIGAN STATE BOARD OF PHARMACY.

To the Michigan Pharmaceutical Association,

GENTLEMEN:—In compliance with the law, I have the honor to submit herewith, the Annual Report of the Michigan Board of Pharmacy, for the fiscal year ending July 7th, 1891.

The Board has found it necessary to hold three extra meetings in the past year for the purpose of examining candidates for registration. Owing to the increased number presenting themselves, the classes had become so large that it was impossible to find halls large enough to comfortably accommodate them: the Board have examined 353 applicants for certificates as "Registered Pharmacist," and 47 for those of "Registered Assistant Pharmacist," granting 151 to the former, and 111 to the latter, the excess in the latter, being accounted for by a rule of the Board, under which "Assistants" certificates are granted to those who desire them among the class who, failing to pass a full and satisfactory examination, yet pass sufficiently high to warrant the Board issuing them certificates as "Assistants."

The Board has received and disbursed monies during the year as follows.

RECEIPTS.

Balance on hand at last report			$1,312 54
From reserve fund in hands of State Auditors			1,000 00
2811 Renewals of certificates	$1.00		2,811 00
181 do	do	50	90 50
262 Applications for examination		3.00	786 00
126 do	do	1.00	126 00
Interest on deposits			36 75
Total			$6,162 79
Disbursed as per accompanying vouchers			4,445 13
Cash in the hands of the Board's Treasurer			$1,717 66

The Board in its last Annual Report, gave the number of Pharmacists and Assistants registered in the State as,

	Pharmacists.	Assistants.
Highest register number July 7th, 1890	3,477	440
Dropped from rolls	571	204
In force July 7th, 1890	2,906	236
Added during the year	151	111
	3,057	347
Dropped during the year	106	78
In force July 7th, 1891	2,951	269
Dropped to date	677	282
Highest register number July 7th, 1891	3,628	551

There have been 76 complaints received during the year for violation of the Pharmacy Law, which number, added to those previously reported, makes the total number to date 295.

There are nine cases in the hands of our attorney at the present time. The attorney has secured fifteen convictions during the year, making the total number to date fifty. The total cost of this work has amounted to $3,825 76, the fines aggregating $621.00.

Herewith please find a complete list of the names of those persons who are registered under the law, in the State of Michigan, and whose certificates are in force at the present time.

Respectfully submitted,

JAMES VERNOR,

Detroit, July 7th, 1891. Secretary.

On motion, the report of the Board of Pharmacy was accepted and placed on file.

President: The next business in order is the report of the committee on membership, the chairman of which committee, I believe, is Mr. Anderson, of Detroit.

REPORT OF COMMITTEE ON MEMBERSHIP.

Mr. E. S. Anderson: In making the report for the committee on membership, I feel I should preface what I have to say with an apology for the small progress that has been accomplished by the committee. The committee about the middle of September sent to every member of the Association outside of Detroit an application blank with a letter requesting each to get some one to fill it out. The replies to those circulars have been very few, only three applications having been sent in in response to something like five hundred circular letters sent out. The President of the Association, at my request, wrote to each of the wholesale houses, asking them to instruct their salesmen to do all they could to help us in the matter of obtaining new members. It will be remembered that last year the salesmen were of great assistance to the committee in securing new members, but so far this year I have received no applications from this source. I would state, that in addition to the President writing to the wholesale houses, I wrote to them myself and saw a few of them personally. The committee have accomplished very little compared with what it should have accomplished, and with what some of its predecessors have done, and I can only account for it by saying that it is possible that the committee's chairman did not go to work in the right way to get members.

On motion of Mr. S. E. Parkil , the report of the committee was received.

President: The next business is the report of the committee on Pharmacy and Queries, of which Prof. A. B. Prescott is chairman. As he is absent from the room at present, we will call upon this committee later. The next in order is the report of the committee on adulteration, of which Mr. H. W. Snow is chairman.

Mr. Snow: The committee has not yet got its report in form for presentation and we would prefer that the time be extended for our report until the next session.

President: It will be so ordered and the committee will report at the next session.

Prof. Prescott: There is a delegation from the Michigan State Medical Society with us this afternoon, a delegation which is appointed to meet this Association at this meeting. The committee consists of Dr. Duffield of Detroit, who is not yet present, Dr. Breakey of Ann Arbor, who is

with us, and your humble servant, and I desire that some member of this delegation who is a more faithful member of the Medical Society of Michigan than myself, should speak first for it. I have had the privilege of membership for many years in the Michigan State Medical Society and have always enjoyed its meetings when I could be present. Not being engaged in the practice of medicine, I cannot speak for them on all points, and so will ask Dr. Breakey to speak for it.

Dr. Breakey then addressed the Association, at the invitation of the President, as follows:

Mr. President and gentlemen of the State Pharmaceutical Association: In behalf of the Michigan State Medical Society, I am very happy to meet you. I wish to say that Dr. Prescott, with his characteristic modesty, has rather reversed the order of the committee, as he was at the head of it. I accept his introduction, however, with the understanding that he shall supplement any remarks I may make, and he is able to do that as a member of the Michigan State Medical Society. I wish to say to you, in behalf of the State Medical Society, that the sentiments expressed in the President's address are entirely reciprocated by that body. It was through some inadvertence that a written response was not made by the Medical Society to your communication which was presented to it. It was spoken of by the Secretary of the Association and myself, but in the hurry of other work the formal response was forgotten, and I think for that reason the President has appointed a full committee to wait upon you. I wish to say further in reciprocation of the sentiments of the President's address that I am sure the Michigan State Medical Society heartily agree with you in the hope expressed that there shall be closer and more cordial relations between medicine and pharmacy in the State of Michigan. We recognize pharmacy as the handmaid, indeed, I may say the right hand-maiden of medicine. In the early history of medicine, as you know, the doctor did everything, from compounding his own medicine to the work that is now performed by the dentist, surgeon, midwife, but gradually our work has grown so that we have been compelled of necessity to delegate this work of pharmacy to a particular profession, and very many specialties have grown up in the practice of medicine itself. We now rely upon the pharmacists to furnish us medicine, although we are now frequently importuned by gentlemen who come to us and ask us to purchase medicines directly from them, and I think I should rather enjoy a little retributive justice in getting at them and talking to them for an hour and a half, perhaps, and in that way I might get even with them. Gentlemen who come to us with such enthusiasm, and with

an earnest wish to instruct the doctor that he wants this remedy and that remedy for his office. For myself, and I believe I speak for the better sentiment of the practitioners of Michigan, certainly I do for the State Medical Society, we prefer to procure the remedies we need from the pharmacists, rather than be obliged to depend upon some one else for them, provided we can always obtain what we wish. I elicited this idea only recently from a pretentious gentleman, who thought he knew better than I did what I wanted, and who insisted upon leaving some things with me. I said to him that if those medicines proved to be all that he claimed for them, when I wanted to refill this stock I did not want to be obliged to send to New York, Philadelphia, St. Louis, or any one of forty places where those things were made; I wanted to find them right at home. I say to you, I believe that is the coming ideal relation between medicine and surgery, and I can fancy the feelings of the reputable scientific pharmacist, who has possibly spent three or four years in this university, as required by the state law to qualify him to do his work, and who, after all that is required to pass an examination so he may be safely presumed to know something about drugs in which he deals and dispenses, or makes up in prescriptions, and the law very justly requires that—I say I can imagine the feelings of that young man who has gone through all this course of preparatory instruction and understands that he has allowed them to sell some secret nostrum which he knows nothing about, and he is required to go through this course of education for the purpose of handing out patent medicines, soap and sugar. I congratulate this society on the progress it has made in remedying so many of the evils that the entire state and this organization and the State Medical Society have had to encounter. I congratulate you in achieving so much within so few years. You have accomplished more in the way of legislation than the State Medical Society has accomplished in its whole life. You have established not only this examination so that people may be assured that their prescriptions have been put up by scientific pharmacists, but you have, if I remember correctly, successfully enforced a professional, if not a statute law some years ago, when a secret preparation was sought to be put upon the market under a fraudulent name, so that it was exposed, and exposed chiefly through your instrumentality. I congratulate you in various other ways on having done so much to secure the benefit which this state has given to its inhabitants in establishing a school of pharmacy, such as you have here at Ann Arbor. I can imagine how a druggist must feel to see his name over an advertisement guaranteeing the character of the advertised article. I am assured personally by many of my friends who are druggists, that

their names have been abused in this respect, and if I speak plainly upon this I do it with the hope that this society and the State Medical Society may work together on such points as these. It cannot be possible that any reputable scientific pharmacist desires to see his name in a newspaper advertising some patent nostrum. It is quackery that promises to cure. The physician never promises, and I am sure that reputable druggists never permit their names to be coupled with such things in the newspapers. This is certainly an abuse by the advertiser, and when druggists have been deceived by advertisers in that way, they should take some means to let them be known. There are very many things I would be glad to speak upon, but I think I am speaking at a disadvantage and somewhat hurriedly, with the fear of taking up your time. I want to say, however, that in an address I had the pleasure of delivering before the section on practice in the State Medical Society a year ago, I spoke of the relation of medicine and pharmacy, and I took occasion to express to the State Society the same sentiments I have expressed to you here, and the same sentiments which I find so well voiced in the address of your president.

I shall take pleasure in informing our society of the cordial relations desired to be maintained between these societies on your part, and I hope that both medicine and pharmacy may be agreeably developed along the line of the better needs of each organization, and that scientific medicine, in which pharmacy is a recognized branch, will be benefited by these relations. I thank you for having heard me so patiently on behalf of the State Medical Society, and I believe other things can be said much better by my friend Dr. Prescott than I can say them, and I trust that Dr. Duffield will be here to add his words to what I have said.

Prof. Prescott: To reinforce myself as a member of the State Medical Society, and to give further evidence that I am a member, I have brought with me a volume of its proceedings. It is a good sizable volume and I think speaks well for the State Medical Society. I believe I may say it is the first year in which copies of the State proceedings have been permanently bound in cloth, and it is an advance on which we wish to congratulate them. The last meeting I believe was its 26th annual meeting, while ours is the 9th. I took occasion to find a volume of the State Medical Society's proceedings for 1883, the birth year of our society, and this is the volume. Their volumes of proceedings have been larger and smaller, as ours have been larger and smaller. Two years ago they made a great advance by dividing up the general body into sections for the several

subjects, surgery, practice, hygiene, etc., and on the whole they are working on the same line that we do. Their list of membership is large in proportion to the body of physicians. It is perhaps not so large as it ought to be, five or six hundred members, I should judge from the slight estimation of the membership list I have been able to make in this volume. I think they have a better representation of their membership at their meetings than we do. I think there are a great many things this society can learn and profit by from the example of the State Medical Society. Involuntarily I speak more perhaps for myself as one of the fraternity of the pharmaceutical body rather than of the medical. I have been a more constant attendant, because of my pharmaceutical work as a teacher, and because I have been somewhat more largely engaged in pharmacy than in medicine, although I have not been free of all responsibility in teaching both.

The relations between pharmacy and medicine always form an interesting subject, and I should be tempted to say something myself upon it, but you will notice in the program that Dr. Vaughan's subject of address this evening is this very topic, the relations of pharmacy and medicine. Dr. Vaughan has been engaged in teaching classes of both schools for many years in this university and it will be of interest to hear him. At the present time his work is altogether in the medical college, of which he is the dean, but for many years he had a class in the school of pharmacy as well. You will certainly excuse me from any further remarks. And I join with Dr. Breakey in hoping that Dr. Duffield, of Detroit, will be present before the close of the session.

Mr. Vernor: I move that the privileges of the floor, as accorded to our own members, be accorded to Dr. Breakey. Carried.

President: We are very glad to hear from these delegates of the Michigan Medical Society, and I hope this Association will have an able delegation at the next meeting of the Medical Society. The next business, according to our program, is the report of the committee on Legislation. Vice-President Vernor is the chairman of that committee.

Mr. Vernor then submitted the following report:

REPORT OF COMMITTEE ON LEGISLATION.

To the Michigan Pharmaceutical Association:

GENTLEMEN—Your Committee on Legislation have the honor to report that during the session of the last Legislature there were introduced two bills affecting the Pharmacy Law: one of them, known as the Downing Bill, had in view the registration of physicians without examination before the Board of Pharmacy, they only being obliged to show that they were registered as physicians in the office of the county clerk, and upon such showing it became the duty of the Board of Pharmacy to register them as

pharmacists. The injustice of such a measure was so apparent to your Committeee that we at once called the attention of President Prall to the bill, and requested him to instruct the Secretary to send out to the members of the Association blank forms of remonstrance against the measure, with the request that as soon as the signatures were obtained they should be forwarded to the Representative of the district from which they were sent. This work was done by the Secretary, but your Committee were very much disappointed in the number of petitions that were reported to the Legislature, and found their work very much increased in consequence. We were, however, able to show to the satisfaction of a sufficient number of the members of the body that the measure would, by granting registration to physicians without examination, while those students of pharmacy who had passed through a thorough course of study were compelled to pass such examination, work a great injustice to the latter, and to prevent the passage of the measure, although favorably reported upon by the Committee of the House to whom it had been referred. The failure of this bill antagonized the House Committee, so that we were unable to do anything with the other measure that had been introduced with the intention of strengthening the law, and we were unable to get any action whatever upon it.

Your Committee have a few recommendations to submit to you for your consideration, and, as action upon them at the present meeting is unnecessary, by reason of the fact that no meeting of the Legislature will be held until after the next meeting of this Association, we take the liberty of recommending that the same be referred to the next Committee on Legislation of this body, with instructions to report thereon at our next annual meeting.

The first recommendation we desire to make, is, that in the event of there being introduced in the Legislature, as there are sure to be, bills intended to nullify the beneficial advantages of the Pharmacy Law, the proper forms of remonstrance may be placed in the hands of every member of this Association at the earliest possible moment, and, to prevent a recurrence of the disappointment of last winter, accompanied with the request that they be forwarded as soon as signed, to the Chairman of your Committee on Legislation, to be placed by him in the hands of a member of the Legislature who is friendly to the Pharmacy Law, for presentation at the proper moment, thereby preventing the withholding of petitions from presentation which fall into the hands of members who do not look upon the Pharmacy Law with favor.

Your Committee further respectfully recommend that a carefully prepared bill be introduced in the next Legislature that shall provide for necessary amendments to the Pharmacy Law in the following particulars: First, to make proprietors equally responsible with the employe, where the latter is unregistered, for violation of the law by the employe. The present law says that the proprietor "shall not permit," and as a result all the proprietor has to prove is that he told the clerk not to make sales during his absence. The reading should be "in whose place of business shall occur." Second, your Committee recommend an addition to the Law, so that the Board will be plainly authorized to employ any legal assistance they may find necessary in pursuance of the carrying out of the provisions of the Law, and also give the necessary power to an attorney so employed to permit of his making complaints against the violators of the Law, without the necessity of first getting the permission of the prosecuting officer of the county in which the violation is found to exist. It would seem to be the plain reading of the Law, wherein it says, "The Board shall examine all complaints, and *cause* prosecution," to be the privilege of the Board to employ legal assistance, but that a doubt exists as to such power is plainly evident in the action of the Board of State Auditors, it having been decided recently by them that no such power existed under the Law, and they have notified the Board of Pharmacy that in the future no bills for such expenditures will be allowed. While a strict construction of the Law might be made to appear that way, you will readily understand what a great drawback in the matter of prosecutions this is likely to become.

Your Committee believe that such action by the Board of State Auditors might be reversed by them if it were shown to their satisfaction that it was the intention of the Law as understood by the framers thereof to permit of the employment of legal assistance where required, and it seems to your Committee that this body who are so directly interested in the workings of the Law, as well as the persons who furnish all the means necessary to maintain the same, could, by resolution of approval of the course pursued by the Board of Pharmacy in the past in the matter of employing Attorneys where necessary, convince the Auditors that a reversal of their decision would be proper.

[Respectfully submitted.] JAMES VERNOR, Chairman.

On motion of Mr. J. Jesson, the report of the committee on Legislation was accepted and adopted.

Mr. Dupont: Is it in order to offer a resolution regarding this report?

President: It is in order.

Mr. Dupont then offered the following resolution:

WHEREAS, It having come to the knowledge of the Michigan Pharmaceutical Association, that the Board of State Auditors have recently notified the Board of Pharmacy to discontinue the practice of employing legal assistance in the prosecution of violations of the pharmacy law, as unwarranted by the law, and:

WHEREAS, The pharmacists of the State of Michigan, of which this is a representative body, drafted and submitted the said law to the legislalature by which it was passed, and have furthermore defrayed the entire expense of the maintenance of the Board of Pharmacy since its origin, therefore, be it

Resolved, That in our opinion it was the intention of the law to allow the Board of Pharmacy to employ legal assistance in the investigation and prosecution of complaints of violation of the law, and their action in so doing in the past meets with our hearty sanction and approval, and further,

Resolved, That the Board of State Auditors be and they are hereby requested to reverse the decision recently made by them, so that the Board of Pharmacy may again resume the practice of employing legal assistance whenever it may seem to them proper to do so in the investigation and prosecution of violations of the law.

Resolved, That the Secretary be and he is hereby directed to send a copy of these resolutions, to the Clerk of the Board of State Auditors.

Mr. Dupont: I move its adoption.

Mr. Vernor: I trust there will not be one single dissenting vote on this resolution. I hope that when it is sent to the State Board of Auditors the secretary of this Association may be able to put upon it that it received a unanimous endorsement.

Mr. Gundrum: If there is any objection it had better be ventilated here. It may appear to the State Board of Auditors that this resolution came up in a form all cooked and dried and went through without any discussion. For myself, I am heartily in favor of the resolution, but there may be members who are not on the State Board of Pharmacy that have objections to it, and if they have I think they had better speak their views on the subject.

Prof. Prescott: It seems to me it would be well to have a free discussion upon it and a full expression of opinion.

Upon request the resolution was again read.

Mr. G. J. Ward: I would like to ask the Secretary of the State Board on what grounds the Auditors refused.

Mr. Vernor: They construe the law, as it reads, to mean that the members of the board themselves shall make the investigation and carry on the prosecution. They asked the State Board of Pharmacy to come before them at Lansing, and we met with them there and tried to show them the utter impracticability of a business man leaving his business and going out to prosecute these cases and secure the necessary evidence. That it was utterly impracticable that we should do detective work and in addition to that go again to make complaint and to the trial, but they did not agree to that view at all. They insisted that it was our duty, that was what the law said we should do, and we should do it. The result will be that instead of our being able to enforce the law and to punish violations of the law, as in the past, we will only now and then have one or two easy cases where we can get the evidence without much detective work and secure a conviction. A large majority of cases will have to go by default unless we can have necessary legal assistance and push the case to a finish. They suggested to us that if a violation was reported to us we should report the same to the prosecuting attorney of the county. I submit to you, gentlemen, the question, what would the result be? When you notify the prosecuting attorney of the county that some man in that county has violated the pharmacy law, what can he do? He cannot obtain the evidence. We have not the evidence. There is no evidence. He cannot go on and convict that man. There must be evidence obtained by which a conviction can be secured. No prosecuting attorney considers that as part of his business. Under this condition of things it would become necessary to call upon the State Board of pharmacy to do the work which they are not fitted for.

Mr. Parkill: Take for instance a town of the size of Jackson. Some man in Jackson is violating the law. Somebody must go to that man and obtain from him some drug that he is forbidden to sell. He must obtain it while there is no other man in the store and the man must swear that the thing he gets is the thing he calls for, and it must be presented in court. Take Jackson for instance; I think there is hardly a member of the Board of Pharmacy who is not known by appearance at least to every druggist in Jackson, and the moment a member of the Board should go into a store, it would be absolutely impossible to get anything of that man, and you might hang around there until

doomsday and the man wouldn't sell you anything. It is necessary that some one should go there whom the man does not know, whom he will sell to. Our attorney tells me that there is not one prosecuting attorney in ten that knows anything about the pharmacy law. The complaints must be drawn into form, and heretofore our attorney has drawn them up himself, and he usually has to call the attention of the prosecuting attorney to the law. If we had to depend on the prosecuting attorneys we would not get any enforcement of the law at all. For instance, you go into a man's store and buy an ounce of something he is not allowed to sell and you go to the prosecuting attorney's office and ask him to commence proceedings against him. He will say that is a very small matter. Very likely that man has a little influence in political matters locally, which goes a great way towards interfering with the enforcement of the law. All these matters must be taken into consideration in considering this question.

Mr. Webb: Have you found it a difficult matter to secure the co-operation of the prosecuting attorney in the first place, and to get a jury that would not be prejudiced against the board?

Mr Vernor: In two cases only has our attorney had any difficulty with the prosecuting attorney. Our attorney has had no trouble in getting all the evidence required, and we have had out of the fifty-two cases that came to trial, but two failures to convict. One of these was due to an informality in the complaint and one was through the failure of a witness to swear to what he knew. We employed a man to purchase the drug, he did so and he knew what it was, but when the trial came off the last words he said to our attorney before going on the stand were, "O, yes; I know. That was Rochelle salts," and he went on the stand and deliberately swore that it was oxalic acid.

Mr. Colman: When I was deputy oil inspector several years ago, there was a strong prejudice against the law and there was an idea that it was a device gotten up by the Standard Oil Co. The difference in price in oil between our state at that time and neighboring states was sufficient to furnish a very substantial inducement to anybody to violate the law. This was especially so in the western portion of the state, and we had a good deal of trouble over there. At that time I found. in connection with the enforcement of that law, the same thing that the Board of Pharmacy has found in respect to this matter. I found it was a hard matter to secure the co-operation of the prosecuting attorney. What Mr. Parkill has referred to, local political influence, was the main obstacle in the way. The prosecuting attorney was asked in one instance to prosecute a man.

That man was a man who had some little influence with the prosecuting attorney and he did not want to prosecute him. Usually he would advise me in the first place to let them off, make them promise not to do it again, and all that sort of thing. If I would not do that he would push it, but he would draw up his papers in an imperfect way so the case would be dismissed, and the state inspector was obliged to employ an attorney at his own expense to see to it that the papers were properly drawn. We could not accomplish much, for the prosecuting was cold, at least, the sympathies of the jury were with the violator, and it was impossible to enforce the law. The matter of detecting a man in the violation of the law was a difficult thing, but we succeeded in doing it. But even after doing all that, we learned that we did not want to bring many prosecutions; that it was better to scare them all we could. I think it would be better for you to act in that way. I think since the law has been made less objectionable the scaring policy has been a successful one. It seems to me that to ask the Board of State Auditors to give us authority to employ an attorney and then ask them to audit the bills is scarcely the right way to get at it. Some attorney, some inspector, ought to have charge of this particular part of the business, it seems to me, and we should not be dependent upon the local prosecuting attorneys. Just exactly what he should be, whether an inspector or some new officer, I don't know, but I hardly think we shall get the board of Auditors to allow this board to select their own attorney and make their own arrangements with him.

Mr. Vernor: I just wish to correct an impression that Mr. Colman has. The board of auditors does not find any fault with the officer, nor with the employment of this attorney in the abstract. They put it on the ground that upon principle we have no right to employ an attorney at all. They have no objection to the man who has been the attorney, of the board since the organization of the board. They admit that the board undoubtedly acted in accordance with its views of what was right, but they insist that the law does not permit it. They insist that we shall report to the board of auditors the expenditures, and afterwards they shall pass them or not as they see fit.

Mr. Parkill: Until the law shall be amended we cannot designate any particular person who should prosecute violations under this act, but the law can be amended. As the law stands it would rest with the board to order such prosecutions.

Mr. Colman: Do you think you could get the board of auditors to change their interpretation of the law without getting the law amended?

Mr. Parkill: Our accounts are different from those of

other boards. All other boards receive their funds from the State Treasurer and they spend money derived by direct taxation. Our board gets its money from the druggists, and what we want is an expression of opinion from the druggists. It simply amounts to this, that the druggists pay for the prosecutions themselves, and we want an expression from them whether they desire that the board shall be allowed to employ an attorney to continue the prosecutions for violations of the law.

The motion carried unanimously.*

President: The next business in order is the report of the delegates to the American Pharmaceutical Association, which met in New Orleans. Mr. G. J. Ward was the chairman of that committee.

Mr. Ward: Not being able to attend that meeting I wrote the other members of the committee, and several of them consented to take notes of the proceedings and prepare a report to be presented at this meeting. My alternate, I think, on that committee was Mr. Vernor of Detroit. He being my representative in that matter and having attended the meeting, as I understand, probably has something to report on that meeting.

President: Has Mr. Vernor a report?

Mr. Vernor: I really did not know I was on that committee. I do not know that there is anything to report. I was there and I will say it was, as far as I could judge, highly successful and highly entertaining. We enjoyed it immensely. I had not the slightest idea that I was on that committee. Mr. Parsons was there and took full and complete notes. I suppose he has them in his pocket and expects to be called upon.

The President then called upon Mr. Parsons.

Mr. C. W. Parsons: I see here quite a number, three or four, members who had a better time than I did and who were around a good deal, Mr. Stevens, Mr. Snow, Mr. Parkill, Mr. Vernor, Mr. Bassett and several others. You all know it was the first time in a number of years that the American Pharmaceutical Association met in the southern part of the country. The attendance was very gratifying in point of numbers, largely, however, from the Gulf and Southern States. The principal business of the meeting was the discussion of the cut-rate patent medicine question, and as you are all familiar with the action taken there, it is only necessary to state that a committee of ten representative pharmacists from all parts of the country were appointed to consider this question, and formulate plans for submission to the N. W. D. A., which is being done this week, I believe. The amusement features consisted of carriage rides,banquets,

*See Appendix for result of action in this matter.

and other things of that nature. In the scientific section we had a number of scientific papers, by Prof. Patch, Prof. Stevens and Mr. Snow, and quite a notable one by Prof. Lloyd, on the Assay of Fluid Extracts, by a process of his own. I did not know that I was on this committee. I knew I was an alternate, but there seemed to be enough there who were members of the committee to attend to it and I gave it no more attention.

Mr. Ward: I do not think Mr. Vernor will deny his signature. I have a letter here which shows that he was aware that he was a member of the committee. [Mr. Ward then read Mr. Vernor's letter.]

Mr. Vernor: There is no getting around that letter, and I presume I will have to furnish some other excuse.

President: There were delegates appointed to attend the Illinois Pharmaceutical Association; are the members of that delegation present? There were also delegates appointed to the State Associations of Indiana and Ohio and to the National Wholesale Druggists' Association. Mr. Parkill and Mr. Brown are both here. I also appointed Mr. Bassett a delegate to the latter meeting. Mr. Bassett is not here, being now in attendance on that meeting, which commenced its session yesterday. We hope to hear from that Association before our session is finished. I was appointed as delegate to the State Medical Association which met at Saginaw. My credentials were presented, but they had matters of such extraordinary interest before the society; that was as far as I heard from it.

The next order of business will be the reading of papers. Are there any papers to be presented to the Association?

Prof. Prescott: Before passing to the next order of business permit me to say that President Angell, who was to have been with us at the opening and welcome us to the University, was obliged to be absent at the opening of the session. He is now present and I hope we may hear a word from him.

At the invitation of the President, Prof. Angell then made a brief address of welcome to the Association, which was responded to by the President.

President: The reading of papers is the next in the order of business. Are there papers to be presented?

Prof. Prescott: The committee is not informed as to the titles of papers to be presented, definitely. I see before me some three or four readers of papers that are to be given, as I am informed, but I am not informed whether the members are ready at this session or not. I hold in reserve some reports of work from the School of Pharmacy which I can present at this time if desired, but I would prefer if any gentleman has a paper he should read it now. I know

some authors of papers have left at their hotel some illustrations they desired to use in connection with them. I wish to say on behalf of the School of Pharmacy, Mr. President, that it has seemed well to the faculty to present abstracts of theses of the work of the School of Pharmacy, in connection with the work required to be done by candidates for graduation, and which is, all of it, in some measure original work. I say it has seemed well to the faculty to present a summarized report of this work rather than the individual papers.

A REVIEW OF THE CONTRIBUTIONS OF THE SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN FOR THE YEAR 1891.

The contributions of the candidates for graduation in this school, since the last meeting of this association, have pursued lines of work which for convenience may be classified as follows:

1. Chemical Analyses of Medicinal Plants. From six workers.
2. Pharmaceutical Preparations and Methods of Preparation. From nine workers.
3. Drug Assays and Assay Methods. From five workers.
4. Adulterations and their Means of Determination. From four workers.
5. The Analysis of Nostrums. From two workers.
6. Investigation of Chemical Questions. From four workers.

Just at this time, by your leave, I will present an account of the work under one or two of these heads, beginning with chemical analyses of medicinal plants.

PLANT ANALYSES.

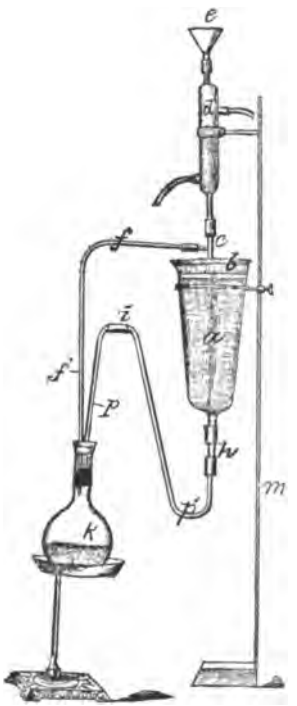
The full systematic chemical analysis of a plant or vegetable drug is a work of patience for a time that can be counted in months, but it gives such an enlarged acquaintance with the classes of drug materials, active and inactive, that it has proved an attractive piece of work to ambitious students. In taking up a drug not previously analyzed in full, it is most desirable, if time permits, to make first the full plant analysis, covering all constituents. But whether this has to be done or not, the more fruitful operations are those which follow, namely: the examination and estimation of one or two of the more active or more interesting chemical compounds found in the plant. In the full analysis the scheme of Dragendorf is much used, with frequent resort to Parsons' method, and in the separation and purification of a distinct compound, each worker proceeds upon his own discretion, except as he counsels with his teacher, and he is obliged to go on with the same independence in his study of the reactions of the purified body. For this independence a needful preparation is the course in organic analysis, one of the concluding sub-courses in which is entitled "plant analysis."

THE RESINS OF A MEDICINAL HERB OF CHILI, *Haplopappus Baylahuen* —C. Gay [*Hysteronica Baylahuen* (Gay) Baillon,] was subjected to a chemical examination, with a full plant analysis of the entire drug, by MR. HARRY KAHN (1).—The leaves and stems are loaded with a feebly balsamic and slightly glutinous resin, which was found to make 21.15 per cent. of the drug. It is a domestic remedy in Chili, and physicians have found it to exert a marked influence on the mucous membrane. (H. RUSBY, *Druggist's Bulletin*, *4*, 39. G. B. BAILLE, *Bulletin General de Therapeutique*, Feb. 28, 1889, page 160.) The resins were separated from each other by action of caustic soda, followed in each of the resulting layers by action of barium chloride, so that four portions were obtained. Each one of the four por-

(1). In full in *Am. Jour. Phar.*, 63, 377, August, 1891. Mr. Kahn received the degree of Ph. G. in the Illinois College of Pharmacy in 1889, entered this school in the autumn of the same year, and obtained the second degree, that of Phar. M., in this University in June, 1891.

tions was subjected to four color-test reagents, and very bright color-reactions were obtained. The volatile oil of this drug amounts to over six per cent. of it. The relation of the volatile oil to the resins has not been studied. Generous samples remain in the museum. It ought to be mentioned that in overcoming the difficulties encountered in the alcoholic separation of the resin, a new extraction apparatus was adapted by Mr. Gomberg, the assistant in organic chemistry, and this convenience is perhaps worthy to be shown in this connection.

GOMBERG'S EXTRACTION APPARATUS.



This apparatus, which is for the continuous extraction of comparatively large quantities of drug, was constructed by Moses Gomberg, B. Sc. assistant in organic chemistry in the University of Michigan, in the chemical laboratory of which institution it has been in almost constant use for the last three years.

It consists of an ordinary conical glass percolator *a*, of about 2 liters capacity; the upper opening is fitted with a circular piece of board *b*, which is about 2.54 cm. thick, and after it has been covered with chamois skin or other suitable material, should fit tightly into the percolator. In the center of the board *b* is a hole to admit a rubber stopper through which one arm of the T-tube *c* is inserted, the upper arm being connected by means of rubber tubing to an upright Liebig's condenser *d*, to the upper end of which is attached by means of rubber tubing a small funnel *e*, to facilitate the addition of menstruum. The other arm of the T-tube *c* is connected by means of rubber tubing to the hard glass tube *f* and f^1, which is about 1 cm. inside diameter, and is so bent that *f* is 25 cm. long and f^1 45 cm. To the lower opening of the percolator is attached, by means of rubber tubing, a short piece of combustion tubing *h*, which is drawn out to allow a piece of hard glass tubing *p* and p^1, 1 cm. internal diameter, to be attached. The tube *p* and p^1 is bent so as to form a syphon, the upper end being a little below the powder in the percolator; p^1 from the connection with the combustion tube *h* to the second turn *i*, is 35 cm.; the remainder *p* 25 cm., should run parallel with f^1, and both *p* and f^1, are fitted into a two-holed stopper, which in turn is fitted into a Florentine flask *k* of one liter capacity. The whole apparatus is supported by a high retort stand *m*, the percolator by a large ring, and the condenser by a condenser clamp. The flask *k* is supported by a small retort stand fitted with a suitable ring. The syphon *p* and p^1 may consist of two sections, joined by a piece of rubber tubing at *i*. The use of the apparatus is readily understood from the above.

A Member: What is the therapeutic action of this drug.

Prof. Prescott: I have no distinct recollection about it, but I believe it is used for its effect upon the mucous membrane. It is used as a medicinal remedy in Chili and Peru and on the western coasts of South America. It is said to have a marked influence, and to have a somewhat sedative or soothing effect upon the mucous membrane.

I have an idea that its general use is something like that of Golden Seal.

The speaker then passed on to other papers, including the analysis of nostrums.

THE BERRIES OF THE HORSE NETTLE, *Solanum carolinense* (L.), were subjected to a full plant analysis by the author last above quoted, MR. HARRY KAHN (2).—The root-bark and the leaves of the same plant had been analyzed by Mr. G. A. Krauss (*Am. Jour. Phar. 62*, 602, and *63*, 65, 1890 and 1891). Mr. Kahn separated a volatile oil, 3.22%; a fixed oil, 9.75%; and distinct evidences of an alkaloid. The reactions of the essential oil were determined. Since then Mr. Krauss has reported further analysis of the entire plant, and has established the presence, in all parts of the plant, of an alkaloid, which is solanine, and probably, also its derivative, solanidine. Horse Nettle Berries grow in southern United States and have had reputation for medicinal action.

THE ROOT OF *Ceanothus Americanus*, sometimes termed "New Jersey Tea," from a use of the leaves of the shrub for tea, and termed "Red Root" from the color of the root, was subjected to a full plant analysis by MR. HITCHCOCK (3). Nine fractional determinations were made with results grouped as follows. The chemical estimation of the tannin gave in total 6.81 per cent.

1. Moisture	8.285	7. Soda Extract	4.74 / 14.03
2. Ash	2.612	8. Acid "	12.80
3. Benzine Extract	0.926	9. Cellulose	43.20
4. Ether "	1.91	Loss	2.40
5. Alcohol "	8.25		100.00
6. Water "	5.88		

A PLANT ANALYSIS OF THE PICHI OF THE ARGENTINE REPUBLIC, made by MR. LOUDENBECK, is the subject of another of the papers already in publication (4). This article has been under chemical examination by four others, Messrs. Rusby, Lyons, Dietz and Trimble, all of whose work is summarized in Mr. Loudenbeck's report, with account of fuller results in the general analysis, and in examination of several of the distinct constituents. The fluorescent body, a glucoside as it appears, is of decided interest, and deserves further examination

Berberis nervosa, THE SO CALLED FALSE OREGON GRAPE, as termed in distinction from *Berberis aquifolium*, Oregon Grape, furnishes a root that is inquired about, and was chosen for full plant analysis by Mr. Russell (5). He also gives a careful botanical description. The three similar species of Berberis on the Pacific coast, the B. *aquifolium*, B. *pinnata*, and B. *nervosa* were described by PROF. MAISCH in 1878 (*Am. Jour. Phar. 50*, 374.) The B. *aquifolium* had a thorough chemical analysis by HENRY B. PARSONS in 1881 (*New Remedies*, *11*, 83). The Berberis species were described, with a review of their literature, by H. W. SNOW in 1880 (*New Idea*, *1*, 90). Mr. Russell finds berberine, and with it a crystallizable body without color, requiring further attention.

(2.) A Proximate Analysis of the Berries of the Horse Nettle * * * By Harry Kahn. *Am. Jour. Phar.* 63, 126, March, 1891.

(3.) John O. Hitchcock, Ph. C., 1891. *Am. Jour. Phar.*, 63, 430 (September.) The author entered the University from Harrisville, N. Y., in October, 1889. He was then twenty-five years of age and had been three years in pharmaceutical service. He graduated in this school in June, 1891.

(4.) *Fabiana imbricata*, a Plant Analysis. By Harry C. Loudenbeck, Ph. C. *Am. Jour. Phar.*, 63, 428, Sept., 1891. Mr. Loudenbeck entered the school in October, 1888, from Marengo, Ill., took another year in the drug store between his junior and senior college years, and graduated in June, 1891.

(5.) *Berberis nervosa* (Pursh.) By Donan M. Russell, Ph. C. Mr. Russell entered the University from Sturgis, Mich., in October, 1889, having had then three years service in pharmacy. He graduated in the school in June, 1891. Is engaged in pharmacy with H. & F. Thum, West Side Store, Grand Rapids, Mich.

GELSEMIUM was brought under operation by MR. W. K. SCHMIDT, with the object of making further examination of the second alkaloid, Gelseminine, reported by Mr. F. Thompson in 1887 (6). Following at first, the same method adopted by Mr. Thompson, who was consulted by correspondence, a quite sufficient quantity of the new alkaloid was obtained, its reactions as given by Thompson were all verified, and a number of additional reactions determined. Efforts to crystallize the body all failed. Obtained at first, more than once, separate from gelsemine, as a mass of resinous consistence and brown color, it was at last obtained as a floculent pale-brown solid. Finally the process used by Fredigka, in 1873, for separation of gelsemine was used, and the supposed new alkaloid, gelseminine, was separated from the gelsemine, with reactions identical with those obtained from the product of the other method, but without crystallization. If this body, provisionally mentioned as an alkaloid distinct from gelsemine, be merely an amorphous conversion-product of the latter, it is one of unusually distinct reactions and solubilities. There ought to be additional work in which sufficient quantities of both gelsemine and this new body shall be purified and then studied as to the changes to which they are liable under specific influences.

AN OLD DRUG OF MUCH IMPORTANCE, *Cannabis Indica*, was subjected to toil by Mr. Henry F. Smith, in search of light upon its disputed alkaloid (7). A good summary of previous investigations is well presented, and the references are full and made with care. In awarding credit for this valuable feature it may as well be frankly stated that, in spite of all admonitions, the references are left in a very shabby shape by a good many of our students, in the writing up of their original work for final record. The question with Cannabis stood about like this; beside active resins reported as early as 1846, and volatile oils announced in 1857, there have been six investigations in the past ten years by able hands, with discrepant reports of nicotine and of a volatile alkaloid not nictoine. Mr. Smith worked upon 40 grams of the drug by a method of his own adoption; then upon a kilogram by a new method. In each operation he obtained a volatile alkaloid, neutralizing acids, and giving distinct alkaloidal reactions, all of which are clearly recorded in the paper. The reactions are not those of nicotine, but those agreeing with so many reactions as were obtained by the English chemists, Siebold and Bradbury in 1881, for the alkaloid which they extracted in another way and named cannabinine. Mr. Smith in his larger operation, obtained of this base 75 milligrams from the kilogram without special effort for a quantitative result. Using Lloyd's new method for fluid extract, 0.01 per cent. was obtained. The identity of this alkaloid seems to be established, and the name cannabinine may well be agreed to.

NOSTRUMS.

Only two contributions can be brought under this head, and one of these, the next to mention, might be classed under Division 4, that of Adulterations. This is a report upon cosmetics, and when these contain hurtful materials, it is virtually a falsification of their claims, and they may be said to be adulterated. As articles of concealed composition, however, may they be classed as "nostrums."

MR. CAMPBELL limits his work on Cosmetics mainly to the search for poisons (8) but he makes a chemical determination of the chief contents of powders, pastes, and creams for the complexion.

(6.) Gelseminine. By Walter K. Schmidt, Ph. C., *Pharmaceutische Rundschau*, 9. 185, Aug., 1891. Mr. Schmidt entered the school in October, 1889, at 21 years of age, with three years previous service in pharmacy. Graduating with the class of ninety-one, he has engaged in pharmacy with H. & F. Thum, Grand Rapids, Mich.

(7.) *Cannabis Indica*. Does it contain an alkaloid? By Henry F. Smith, Ph. C. *Am. Jour. Phar.*, 63, 386, August, 1891. Mr. Smith came to the school, beginning with October, 1889, at the age of 21 years, from Elyria, Ohio.

(8.) Determination of Poisons in Cosmetics. By Arthur Campbell, Ph. C. This man entered the University from Crystal Falls, Mich., at 19 years of age, fully a month after the opening of the collegiate year, 1889-90. The utmost exertions on his part were needed to enable him to overtake his class before June, but he came out better than his hopes, and had a clear record in his second year. But he would not advise another to follow the same course.

(1) Lorenze Elite Face Powder. Contains bismuth.
(2) Bailey's Swan Down Face Powder. A form of carbonate of lime, elutriated.
(3) Tetlow's Swan Down. Contains zinc oxide to the extent of 35 per cent.
(4) Tetlow's Superb Gossamer. Contains zinc oxide, 60 per cent.
(5) Pozzoni's Medicated Complexion Powder. Contains a form of carbonate of lime, with bismuth, and a very little iron as ferric oxide.
(6) Pozzoni's Dove Complexion Powder. Consists of carbonate of lime with a trace of manganese, as the trimetallic tetroxide.
(7) Linden Bloom. Contains a little zinc oxide.
(8) Luxury. The alcoholic solution to be prepared and used. This solution, as directed, contains a little bismuth salt.
(9) Wetmore's Toilet Powder. Contains 8 per cent. of zinc oxide.
(10) Laird's Bloom of Youth. Contains 32 per cent. of zinc oxide.
(11) Dr. Hebra's Viola Cream. "For freckles, moles, sun-burn, and tan. Apply a small piece before retiring, rubbing it in thoroughly. Repeat each night until all blemishes disappear." Contains corrosive chloride of mercury to the extent of 2.8 per cent.
(12) Hagan's Magnolia Balm. Liquid with a pink colored sediment. The sediment is almost wholly zinc oxide, which constitutes 22.4 per cent. of the whole article.
(13) Malvina Cream. Contains bismuth.
(14) Nelson's Scent. Consists of carbonate of lime, perfumed.
(15) Lotos Powder. Contains bismuth and a trace of iron.

Of course the quality and suitability of cosmetics, granting them free from poisons, depend largely upon the state of division of their solid materials, and upon other niceties of adaptation. An oak plank when rough from the mill-saw is one thing, when dressed and polished by the artizan it is another thing.

A FEW POPULAR REMEDIES FOR RHEUMATISM have been reported upon by Mr. Hubbard (9). Athlophoros was analyzed and found to consist of salicylate of sodium, acetate of potassium, and sugar, colored probably with caramel. One drachm of the acetate, with one-half drachm of the salicylate, and four ounces each of sugar and water, colored, will represent the composition. Hibbard's Rheumatic Syrup, "entirely vegetable," contains cascara sagrada, and analysis cannot readily determine as to the presence of the other vegetable drugs announced on the label. It contains salicylate of potassium, not so announced, and some sugar and a little alcohol. Arthrophonia, not completely analyzed, was found to contain salicylate, tartrate, and acetate of alkali bases, with sugar, and oil of wintergreen. The published analyses of certain other remedies of this class gathered from various sources are included in the paper.

Prof. Stevens: I think we might hear from Mr. Snow on a great many of those preparations. He has done a good deal of that kind of work.

Mr. Snow: There are one or two points on which I might speak. One is in regard to Malvina Cream, I think. I had occasion to examine that some three or four years ago and found quite a notable amount of corrosive sublimate in it, seemingly used as a preservative for the ointment base. It was present in both the lotion and the ointment. The nostrum known as Oriental Cream contains very large quantities of calomel, in fact there is only a little water and alcohol to prevent its freezing in winter.

(9.) Remedies for Rheumatism. By J. L. Hubbard, Ph. C. Mr. H. entered the college from Waterloo, Mich., two years ago, at 22 years of age, and graduated last June.

Prof. Prescott: It was the undertaking of this inquirer to look after poisons, and especially mercury, arsenic and lead. Of course he may have overlooked that.

Mr. Snow: It is present in appreciable quantities.

Prof. Prescott: That was how long ago?

Mr. Snow: Three or four years ago. I will say I published my investigations, and that might have caused a change in the preparations.

Dr. Breakey: I have been very much interested in this discussion, and there are some very practical points in it. Do I understand you to state that one of these lotions contained 2.8 per cent of bi-chloride of mercury?

Prof. Prescott: Yes.

Dr. Breakey: The average disinfectant for surgical purposes is one to 4,000.

Mr. Parkill: That would not take off freckles.

Dr. Breakey: Possibly not.

Prof. Prescott: I invite questions upon these papers, if you so desire.

Mr. Brown: Before we pass from this subject, speaking of Malvina Cream, I was wondering if any of the retailers had had the cream returned as not pure.

At one time I had a number of boxes returned because it had a different appearance from what it usually presented. I sent it back to the manufacturer and he sent other in its place.

Mr. Wurzburg: I once returned four half dozen out of a half gross.

A Member: I had the same experience, and now I never sell a box without opening it and trying it.

Mr. Parkill: On yourself?

The Member: No, not exactly.

President: Are there any more questions upon these papers. Are there any more papers to be read at this meeting?

Mr. Brown: I raise the question with regard to the sale of these preparations containing bi-chloride of mercury, as to whether the Poison Law of the State of Michigan is not violated by their sale, they not being labeled poison? Of course we handle them, but without the benefit of investigation. We are not supposed to know they contain mercury, and the question is whether the manufacturers of those articles ought not to be required to label them as poison.

Prof. Prescott: It seems to me there was some trouble with the Poison Law in Michigan. Didn't it lack a penalty?

Mr. Brown: It is not enforced.

Prof. Prescott: Leave it to the common law to enforce it. I suppose no special provision is necessary.

Mr. Parkill: Then we can all sell it.

Prof. Prescott: The common law is quite sufficient.

Mr. F. A. Thompson: I would like to say that during the last year a lady had given to her a solution for her complexion, and it didn't bear any label whatever. I believe it was given to her in quart bottles. I examined it and found it was nothing more than a solution of corrosive sublimate. This question has been brought up and I thought I would mention it. I thought it ought to be submitted to somebody, but I did not know whether the State Board of Health or the City Board of Health had jurisdiction over these matters, although I believed one or the other had because it affects the health.

Dr. Breakey: I will say, first, that I am not a health officer (although I was at one time a member of our board,) so I feel free from responsibility in what I have to say. I feel, with the experience that our board had in attempting to enforce the law when much more serious violations were sought to be punished, that I could not feel able to accomplish anything in such a case as this, and that was one of the reasons why I got off the board. I have always been informed that the State Board can do whatever local boards can not do, and as some of the members of this organization are members of the State Board, it might be proper to refer it to them. Aside from where the question of responsibility lodges, I am sure it is a matter that ought to receive investigation. It must be a violation of the law which requires druggists to label bottles containing poison when they sell them. If this association could secure an act which would require the publication of the contents of nostrums on the label it would be of very great good. I remember a paper of Dr. Prescott's which he read some years ago, perhaps given before this association, seeking to do just that thing.

Dr. Prescott: I would say with regard to the papers to be presented before the association tomorrow, that we would like to ask for the fixing of the time for the presentation of a paper of especial interest at the hour of ten o'clock, and that it be made the regular order for that hour, or as soon after ten o'clock as the association shall be at liberty to hear it. It is a paper by Dr. Abell, Professor of Materia Medica in the Department of Medicine and Surgery of the University, upon Experiments of Pharmacologists, upon methods of Experimentation in Therapeutics, an illustrated paper or address which he will present. It will probably take forty minutes and I think it will be of great interest. Dr. Abell has been abroad a great many years, engaged in the work of the investigation of physiological effects of drugs upon

animals and drawing conclusions as to their therapeutic value therefrom; methods of pharmacology are what he will undertake to illustrate briefly before you. Tomorrow afternoon a very short paper will be presented by another member of the faculty, not a member of this association, Dr. Freer. He will give some account of a homologue of antifebrin which differs from antifebrin, which contains a salicylic radical. This paper will not occupy probably over ten minutes. These are papers which I will announce for tomorrow. I know that Mr. Thompson has a paper of special interest, and that Mr. Snow has also some. I know that Prof. Stevens has reports upon experimental work in drug assaying which he has been doing.

President: I have no doubt the members will enjoy these papers.

The secretary announced that he had several applications from persons to become members of the association.

On motion of Mr. Vernor, the applications for membership in the hands of the secretary were referred to the Executive Committee for report.

On motion the association took a recess until next morning at nine o'clock.

SECOND SESSION.

[October 20th, 1891, A. M.]

The association was called to order by the president.

President: The first business in order is the report of the Committee on Trade Interest.

Mr. Colman: We find ourselves a little as the colored man was who was to preach one Sabbath morning, and who got up and announced that he had been busy all the week and hadn't had time to prepare his sermon and he would have to rely on the inspiration of the Spirit, and he expected it would be pretty poor stuff. We have been particularly busy and have had but little time to give attention to this matter. As you are doubtless aware, it is a pretty hard matter to originate anything new on this subject of trade interests. We have a brief report to make, which I will now read.

REPORT OF COMMITTEE ON TRADE INTERESTS.

To the Members of the Michigan State Pharmaceutical Association:

GENTLEMEN—Your committee on Trade Interests is unable to bring before you anything important in the way of information, or any new or fresh subjects for discussion.

Always first among old subjects is that of cutting prices on patent medicines. As near as we can ascertain, the condition of the retail drug trade in this particular, is very much as it has been for some time past. There seems however, to be a growing disposition among manufacturers to protect the trade by refusing to sell to advertising cutters. The position taken by the National Wholesale Druggists Association, as declared by them in a resolution passed by them at Indianapolis in 1889, and re-affirmed

by them at Washington in 1890, and the persevering efforts made by them to influence rebate proprietors, and also wholesale dealers to comply with that resolution, give promise of results.

1. We would recommend that this association express to the National Wholesale Druggists Association, our approval and appreciation of this effort on their part, and assure them of our co-operation, both as an association and as individual druggists; and that we also promise our support to those rebate proprietors, and also to those wholesale dealers, who are complying with that request of the N. W. D. Association.

2. Regarding those toilet articles which are sold by fairs, variety stores, etc.; we recommend that some measures be taken looking to a systematic and general discriminating against these articles, and in favor of those whose proprietors keep them out of the hands of such houses.

3. The tendency of physicians to dispense their own medicines, and also to send to "supply houses" for their supplies, is a larger subject today than it was a year ago. If any one has any new light to throw on this subject, it will doubtless be acceptable; and we suggest that further discussion on this old subject will not be improper.

The subject suggested by Mr. Bassett at our meeting last year relative to the liability of a proprietor for a mistake of an employee who has been examined, and authorized by the state to dispense medicines, seems to us to be a subject worthy of further consideration.

The practical ability of clerks in simple matters like the doing up of packages, and the writing of labels, it seems to us, should receive more attention from the Examining Board. We frequently see clerks who have graduated from the A. A. School of Pharmacy, and have been passed by our Examining Board, whose packages and whose labels would disgrace a grocery store.

Would it not be well if each proprietor would report to the secretary of this association once a year, the merits and demerits of each of his employees; so that while the clerk holds his certificate for scientific attainment, the association may also have his record for practical work?

It has been repeatedly urged by members of this association that we endeavor to secure legislation which will require the manufacturers of proprietary medicines, to put the formulas of their compounds on their wrappers; we suggest that the association consider this point.

These suggestions are most respectfully submitted by your committee.

H. G. COLMAN, Chairman.

President: You have heard the committee's report. It is now open for discussion. Have our members anything to say on this question of Trade Interests?

Mr. Parkill: I move that the subjects reported on by this committee be taken up one a time; that we do not discuss the report as a whole, but take up the individual recommendations and discuss them in order. Carried.

Mr. Colman: The first subject in the report is the cutting of prices on patent medicines, and our recommendation is that this association shall express to the National Wholesale Druggists Association its approval of this suggestion, and shall assure them of our cooperation, both as an association and as individual druggists.

Mr. Parkill: I would like to inquire just what you mean by promising our support.

Mr. Colman: I might cover considerable. Support them in any way we can. In the first place that we will not cut prices on such medicines, and the next thing, we will

report to them anybody we know is cutting. Also we will, so far as we can, give their medicines a preference. Of course we cannot promise very much in that direction, but in a general way do all we can to support them in these measures and give their remedies preference. Then when it comes to the wholesaler, he is requested by this association to refuse to sell to men that are cutting. If we know that one wholesaler is doing this, and another is treating it with utter indifference and says let the retailers take care of themselves, we shall discriminate in favor of the man that is not doing it.

Mr. Parkill: I think, Mr. President, that so far as an expression of our good will to the National Association is concerned and an effort to overcome the evil that is spoken of, it would certainly be wise for us to communicate to them our intention to give them our support in this matter. I should like to see the association take some such action as that.

President: Has Mr. Parkill any such resolution to offer.

Mr. Vernor: At this meeting of the Wholesale Association in Louisville, of course Mr. Bassett will represent us, but I think the proper thing for this association to do, meeting at the same time as the other association, is to telegraph them our action in this matter and express to them the fact that we are working in sympathy with the movement they have started, and in the interest of fair prices all around, and I think Mr. Parkill will prepare such a resolution if we wait a few moments.

Mr. Parkill then offered the following resolution which was unanimously adopted.

The Michigan State Pharmaceutical Association in convention assembled sends greeting to the National Wholesale Druggists' Association, and congratulates them on their efforts to regulate the evil of cutting on proprietary preparations, pledging ourselves to the hearty support of any measure adopted to bring about the result.

Secretary Bugbee: I have some applications for membership here which should be acted upon.

Mr. Brown: It seems to me the matter of applications for membership ought to be acted upon promptly. I move that the passing upon these names by the Executive Committee be waived, as the committee is not here, and that the applications be voted upon by the association.

On motion the secretary was directed to cast the vote of the association in favor of their election, and having done so they were declared duly elected.

NEW MEMBERS.

Chalmers P. Allen, West Bay City.
Wm. Dwight Barnard, Manistee.
Reuben T. Bower, jr., Petoskey.
Edward L. Forsyth. Kalamazoo.
Charles V. Hicks, Oscoda.
Fred'k. F. Ingram, Detroit.
Geo. Mc D. Matthews, Chase.
Thos. H. McGee, West Bay City.
Wm. A. Nugent, Alpena.
Frank B. Raynale, Detroit.
P. F. Schuman, Detroit.
Fred'k. K. Stearns, Detroit.
Louis Stoeckly, Iron Mountain.
Frank J. Temple, Ridgeway.
W. A. Tomlinson, Au Sable.
J. David Walker, East Saginaw.

NEW MEMBERS ELECTED BY THE EXECUTIVE COMMITTEE DURING THE YEAR PAST.

Wolf Aisenman, Fort Mackinac.
Andrew R. Cunningham, Detroit.
John C. Furniss, Nashville.
Edward J. Garner, Mackinac Island.
Charles F. Hicks, Pontiac.
Harry Kahn, Detroit.
Mial R. Lyman, Gagetown.
Josephus F. Martin, Bay City.
Miles E. Riggs, Cheboygan.
Floyd D. Simson, Flint.

President: So far as this subject of Trade Interests is concerned we have considered the first recommendation. Is there any further discussion on that point?

Mr. Parkill: In large cities where there are large department stores, I suppose there is no help for this evil except through some such arrangement as the National Association is trying to bring about. There is no particular neighborly feeling between the dealers. Each one works for himself without regard to his neighbor's interests. But in small towns of from one to five or six thousand inhabitants, where all dealers are known to each other, and where there is a spirit of friendly acquaintance between them, sometimes by conference with these men who put in the things at cut rates the thing can be remedied. I will give you a little of my own experience. A little while ago one of our drygoods dealers put in one or two proprietary articles. I went over and saw the gentleman, who is a friend and neighbor of mine, and I put it to him in this way. You do this to draw trade to your store and in doing that you are injuring my business, in order to allow you to sell something else. Of course I do not question your right to sell anything of this kind, because there is no law against it, but I do question your right to go in and slaughter my business to help your own. Finally he consented to withdraw the things and disposed of the articles to me. I went to the other drygoods men and talked to them in the same way, and the result of it was they have all promised not to go into it. So I think by a little friendly talk, a little friendly argument with him, we have got over these difficulties, whereas, if we had gone to work on a plan of retaliation and had abused him we should not have accomplished anything. The point is, where there is this same condition of things, by a little friendly talk and argument, by putting the thing to them on a friendly basis, very often the evil can be done away with.

Mr. Parsons: This question of cutting on patent medicines is one that has very many aspects and phases, and from what I have learned on the subject I find that there are many

opinions, many diverse and varied plans for its correction. Some plans have been proposed, which embrace as a necessary condition a union among the thirty thousand retailers of this country, that at first appears impossible. There are a number of most reputable proprietary medicine manufacturers of this country who now are doing their best to keep their goods out of the hands of people who sell them at less than established retail prices, and they are meeting with more or less success. As Mr. Parkill says, in some of the smaller towns this spirit of friendliness among neighbors may prevail, but you go to a large city and you will find that one man may demoralize the trade of the whole city. You are all aware that recently in St. Louis they were suffering from cutting and organized their local association very strongly, and succeeded in putting down the cutting to a minimum. They then asked representatives from other states to come in with them. They held a meeting of druggists of the Mississippi Valley, and at that meeting they had a representation from half a dozen or more states. Michigan had no representative whatever at the meeting. In consequence of that league, which they then formed, they have brought to bear a very great pressure upon the jobbers of Chicago, and St. Louis, and of eastern cities, until it is almost impossible to get a bill of goods in St. Louis, or in that territory, which are to be sold at cut rates. The Chicago druggists have done the same thing, and they have the cooperation of every reputable wholesaler in Chicago. It was discovered not long ago that a wholesaler in St. Louis was selling goods to a notorious cut rate dealer, and it resulted in an investigation, which caused issuance of a circular in which it was stated that the accused member of the wholesale house was not responsible, but it was done by some one else connected with the house. The result is that the drug trade of St. Louis is so watchful of the jobbers that it is impossible to get a single article there to be handled at cut rate prices. The proprietors are now in session at Louisville, and Messrs. Pierce, Ayer, Hazeltine and others of the leading proprietors are down there with a full determination to control the prices of their goods. They have all come to the conclusion that the manufacturer can, if he will, control his goods, and they can say to a man, you must sell my goods at such a price or you can't have them. It is impossible now, or nearly so I think, in most localities to get Pierce's goods at cut rates unless you get an old stock. I think all that is necessary for this association to do and other state pharmaceutical associations is to act in accordance with President Finlay's expression to the A. P. A., to uphold the proprietors and to uphold anyone who is trying to abolish the evil of cutting.

Mr. Colman: It is necessary for druggists to support

this plan whether they combine in any league or organization or not. They must be of one mind and true to each other. One of the great difficulties with which proprietors of medicines have to contend is that a retailer will buy more than he wants of a certain thing, for instance, and turn the rest of it over to a cutter. How we are going to overcome that, I don't know. It is a pretty hard matter to do it, but it ought to be brought to the notice of every retailer, and he ought to realize that in doing that he is not only injuring himself, but every other man in his own town, if there is any cutting there, and he is injuring the business all over the country. I have a paper here from our friend Pauly, whose genial countenance we miss at this time, which paper bears upon this subject of cutting, although perhaps not exactly on this point, and I wish to read it before we are through with this subject.

Mr. Pauly's letter is as follows:

Our president, recognizing the importance of united effort to counteract the operations of cutters, has issued a circular urging the discussion of views regarding this great evil, and I sincerely hope that many have profited by this timely advice and are in attendance to assist the M. S. P. Association in coming to a full understanding of the requirements, and to agree on a general plan of defensive warfare.

Unable to be present in person, I take the liberty to express a few short opinions on paper. As far as the manufacturers are concerned, I fully believe that they are doing their best to eradicate this evil. It is in their interest to do so and the jobbers are in the same category, but it is apparent that they are more or less powerless, and it therefore devolves upon the retailer to protect himself, and it appears to me that the best step to take would be to offer to the public a class of preparations in place of patents on which prices are cut, manufactured either by the druggist himself, and this of course is the best, safest and most professional mode; or if he is not able to do the work himself on account of small laboratory or other sufficient reasons, manufactured by some responsible and reliable firm for him. This is not substitution; I do not mean that a retailer shall substitute his product if some other is called for, but he should have on hand a reliable article of his own, with his name on the label, so that a dry goods man or grocer cannot sell an article which the druggist offers for sale. There are a number of real valuable proprietary articles in the market, which no cutter offers for sale; for such a druggist need not have a preparation of his own, but as long as the public makes demands for an article already prepared, so long the druggist should be prepared to offer one, on which he can realize a fair profit, and if the manufacturer fail to protect him, he must prepare the articles himself or have it done for him under his name.

And here a thought strikes me. The newspapers have made a great howl, telling how the retail druggist damages the interests of patent medicine advertisers through "substitution."

I wish to call the attention of these gentlemen to one little point: The same paper which carries long advertisements of the proprietary medicine men, stating in many instances the legitimate retail prices of their wares, has in another column the harangue of some cutter, offering the same article at a greatly reduced rate.

It appears to me that the manufacturers should not patronize newspapers containing cutters' advertisements; it may not do much good, but everything is useful in emergencies.

I fully agree with our president that we should organize to combat this evil, and that while the fight should be made under the auspices of the

state association, we should welcome the aid of any druggist, even if for some cause he should not be able or willing to join our association.

St. Ignace, Mich., Oct. 18, 1891. L. PAULY.

Mr. O. J. Parker: Mr. President, I would like to make a statement before this convention. I am from the little town of Howell, of about three thousand inhabitants. I have two competitors, and one of them for four long years has been a cutter of the very worst kind. He has a large banner out in front of his store, stating that he furnishes all patent medicines at cut prices, dollar preparations for 75 cents, and a like discount on small packages. I would like very much to be able to express to this convention my feelings on the subject, but I am hardly able to do it, still I would like to appeal to this convention for some protection from this thing. This competitor, I believe, is a member of this association. It is a pretty serious matter with me, but still I have tried, as my friend from Owosso has, to make things agreeable and be friendly with him, but I have not been able to do it. This man became angry and adopted this plan and he has kept it up for four years.

Mr. Vernor: May I ask the gentleman if he knows where that cutter gets his supplies?

Mr. Parker: I cannot say at the present time. He traded with James E. Davis & Co. before their fire, but where he is getting his supplies at the present time I could not say.

Mr. Vernor: I think if you can say that he gets his supplies from Detroit we can shut him off in that direction.

Mr. Parkill: You can find out from his boxes and packages where he gets his goods.

Mr. Parker: This man's name is Stephen Pratt, and he appears on Pierce's black list.

Mr. Parkill: He has Pierce's goods also?

Mr. Parker: He has not had his Favorite goods for some time.

Mr. Colman: When was he put on the black list?

Mr. Parker: In August.

Mr. Colman: The last list I have is dated October and there is no one from Howell on this list.

Mr. Inglis: It seems to me this is the occasion we want and if we all agree to boycott the man who furnishes him goods, we can do so. If he had rather have our trade than that of one of these dealers, he will probably stop it. At any rate, it is a good chance to make the experiment. We can bind ourselves not to buy any more goods from him until he says he will stop selling to this party.

Mr. Gundrum: If the gentleman spoken of is a member of this association, I move that the secretary correspond with him and request him to withdraw.

Mr. Vernor: This is rather a serious matter to start in this way and rush it through. We can control these men better in the association than out, and we can exert a moral influence over them when they are with us better than we could when they are out. I should hate to see him turned out of the association without a good deal of effort on the part of the association to persuade him to stop it first.

Secretary: I want to say that if he doesn't pay his dues by the time these proceedings are ready to go to the printer, he will be out anyway.

Mr. Vernor: How far is he in arrears?

Secretary: Two years.

Mr. Vernor: I have nothing further say.

Mr. Colman: Still I think the point made by Mr. Vernor is a good one, that we can control him easier in the association than out. It can better be done in a friendly way than any other. The extreme measures advocated by Mr. Gundrum can be taken in the end if necessary, but I shall vote against the motion. I would suggest that the secretary make an effort to get the gentleman to pay his dues, and I think it would be well to be careful of our action here. We might have our secretary confer with him on this matter and urge him to change his policy. If we find him incorrigible, then we can proceed to other measures.

I think we are making some little progress in this matter. Your committee made up their minds that we should adopt some policy on which we could make progress, even though that progress was slow. For one, I was in favor of spending some little time on the matter, even though we made small progress, and if we can get the jobbers in Detroit into the same position that the jobbers of St. Louis and Chicago are, as has been stated here, we have gone a good ways in checking this evil. As to the man at Howell we may shut him off from buying patent medicines in Detroit or at Chicago, but we can't shut him off from buying them in Cincinnati perhaps.

Mr. Parsons: If he can't buy his patent medicines of his own jobber, can he buy anything else?

Mr. Eberbach: Is it the expressed sentiment of this convention that we support the action of the wholesale druggists by resolution? I think the action proposed by my friend Gundrum is too rash, so long as we have taken no steps to regulate this matter in our own state. I think if it is the intention of our organization to take up this matter it would be feasible to appoint a committee of this association, to which all reports might be sent in regard to cutting, from all sections of the state, and that it should be the duty of the committee to make its remonstrances to the respective dealers. I think in that way this association could get con-

trol of this matter. I would give the individual druggists a chance to report to the committee appointed under the auspices of this association in a proper manner, and in that way bring to bear on the respective jobbers and retailers of this state the influence of this organization. I should think in that way we might control a good many of these matters of cutting prices.

Mr. Gundrum: I did not state all that I had in mind in regard to having the secretary correspond with this gentleman. I meant that the reasons should be made known to him why this action was taken, and if he did not express any wish to comply with the sentiment here expressed, that we are opposed to the cutting of prices, he should be requested to withdraw. But in order to have this thing come up in better shape, I will withdraw the motion. I think perhaps I was a little hasty in presenting it.

Mr. Vernor: In this case he does not seem to be anxious to stay in our asscciation. When a man gets two years in arrears, he had just as lief quit. I move you that Mr. Colman, as a member of our associotion, and one of the members of the other association, report to that organization that Stephen Pratt is a cutter; that he was reported in an open convention; and that his name be expunged from the list—does it have to be a specified article upon which he does the cutting?

Mr. Colman: I am not aware that it does. There is nothing here that indicates that, but I think not. We have positive proof that he is cutting.

Mr. Vernor: Does he advertise in the papers?

Mr. Parker: Yes, sir.

Mr. Vernor: And has posters in front of his place?

Mr. Parker: Yes, sir.

Mr. Vernor's motion being then put was unanimously adopted.

Mr. Vernor: I am just informed by Mr. Parsons that such a report requires legal proof. I think he can explain it better than I can and I would like to have him do so.

Mr. Parsons: There has been a number of cases reported to Mr. Kline on that committee of the Wholesale Association, and on following quite a number of them up the evidence was found to be insufficient. So the committee have required that with all such complaints proof that the man is a cutter shall be produced; something in this line, either a sworn affidavit that he is a cutter, or a paper be sent in which he is advertising cut rates, or a photograph of his store where he has signs in front. You cannot expect that upon a simple statement that he is a cutter they will proceed against him, because many of these things have

been done through jealousy and they are apt to get themselves into trouble; if they put a man on the cutters' list, they make themselves liable. Maybe Mr. Parker can get some information upon this matter that would be valuable.

Mr. Parker: If it is necessary to do that I will do so.

President: I would advise that you furnish such evidence to Mr. Colman.

Mr. Hall: I have been informed about this matter of Mr. Pratt by a traveling man who traveled to that town. He mentioned it to me a little while ago, but I had forgotten it until it was brought up. I remember seeing that party's name on that list in August or September, I think.

Mr. Smith: I hear his neighboring druggists at Flowerville and Brighton all complaining of this same man and of his cutting in this way.

Mr. Parker: I wish to say as far as Mr. Pratt and I are concerned, I never had a word with the man in my life. "We simply speak as we pass by." That is the extent of our communication. The trouble between Stow and Johnson and this man Pratt has resulted in this thing, and of course I have had to meet this man when I have been obliged to.

President: It seems to be the desire of the American Pharmaceutical Society that we should form such a league.

Mr. Eberbach: If that resolution means anything, it only puts this association in a position to support them and makes us promise to support them in their effort. The object of the association is to punish such men as these. The only question is whether we shall have somebody in our association to take charge of that matter, the same as the legislative committee takes charge of the legislation.

Mr. Vernor: I move that further discussion on trade interests be discontinued for the present, in order to listen to the paper of Dr. Abel, which was made the special order of the hour.

The motion prevailed, and Dr. Abel presented a most interesting paper. *

At the close of the paper, the thanks of the association were voted to Dr. Abel for his interesting paper.

President: We will listen to the report of Prof. Johnson, chairman of the Committee on Adulterations:

* See Appendix.

REPORT OF COMMITTEE ON ADULTERATIONS.

The chemicals in the following list were supplied for analytical uses. The report is not given on account of deficient pharmacopœial standards, but to show what impurities are so persistent in chemicals as to remain even in those sold as strictly chemically pure.

CHEMICALS EXAMINED.	IMPURITIES FOUND.
Chloric Acid	Hydrochloric and Sulphuric Acids.
Antimony Arsenate	Antimonous Chloride.
Antimony Arsenite	Insoluble Silicate.
Aluminium Sulphate	Ferric Sulphate.
Arsenic (metallic)	Iron.
Barium Chromate	Barium Chloride.
Bismuth Sulphate	Bismuth Chloride.
Cadmium Chloride	Cadmium Sulphate.
" Hydroxide	Ferric Chloride.
" Iodide	Cadmium Chloride
Chromic Oxide	Ferric Sulphate.
Copper, powdered	Iron and Zinc Chlorides.
Ferric Arsenate	Ferric Chloride.
Iron Oxide, magnetic	Insoluble in Acids.
Lead Oxide	Lead Chloride and Red Lead.
" Peroxide	Ferric Oxide.
" Nitrate	Lead Chloride.
Magnesium Carbonate	Magnesium Chloride.
" Oxide, 1st lot	Ferric Chloride.
" " 2nd lot	Ferric Chloride and Sulphate.
Manganese Sulphate	Manganese Chloride.
Nickel Wire	Iron.
Nickel Chloride	Nickel Sulphate.
Potassium Carbonate	Potassium Chloride.
Potassium Bromate	Potassium Bromide.
" Hydroxide (alcoholic)	Only a trace of Potassium Chloride.
" Hypophosphite	Potassium Chloride.
" Nitrite	Potassium Chloride and Carbonate.
Sodium Hydroxide (alcoholic)	Sodium Chloride.
" Hypophosphite	Sodium Chloride and Sulphate.
" Nitrite	Trace of Chloride.
Zinc Oxide	Zinc Chloride.
" Carbonate	Zinc Chloride.

Chemicals found free from impurities were

Arsenious Acid; Chromic Acid; Iodic Acid; Oxalic Acid; Alum, Chromic; Alum, Potassium; Antimony, metallic; Antimonious Chloride; Antimonious Oxide; Aluminium Hydroxide; Ammonium Arsenate; Ammonium Bichromate; Ammonium Carbonate; Barium Bromide; Barium Carbonate; Barium Chloride; Barium Hydroxide; Barium Sulphate; Bismuth, metallic; Calcium Phosphate; Cobalt Carbonate; Copper Oxide; Copper Sulphate; Cuprous Chloride; Cuprous Oxide; Ferric Hydroxide; Ferrous Phosphate; Ferrous Sulphate; Lead, metallic; Lead Bromide; Lead Carbonate; Lead Chloride; Lead Chromate; Lead Sulphate; Manganese Peroxide; Manganese Nitrate; Mercurous Chloride; Mercuric Oxide (red); Mercuric Chloride; Nickel Oxide; Nickel Nitrate; Nickel Sulphate; Potassium Arsenate; Potassium Bichromate; Potassium Iodide; Potassium Chlorate; Potassium Nitrate; Potassium Sulphate; Silver Nitrate; Sodium Carbonate (normal); Sodium Bicarbonate; Sodium Chloride; Sodium Bichromate; Sodium Phosphate; Sodium Sulphate; Sodium and Ammonium Phosphate; Strontium Sulphate; Zinc, metallic.

O. C. JOHNSON.

On motion of Mr. Vernor the report of the Committee on Adulterations was accepted and ordered printed in the proceedings.

President: Shall we resume the discussion of trade interests?

A Member: Would a queston be in order? What is the object of this Committee on Adulterations?

President: As I understand it, it is to give information of adulterations that are apt to occur in drugs we are using and purchasing.

A Member: Are those just mentioned drugs we use?

President: These are used in the laboratory, are they not, Prof. Johnson?

Prof. Johnson: Yes, sir, in the laboratory, and some of them are sold in drug stores. Not very many of those sold in drug stores, however, would be quite as good as those I have reported upon.

A Member: I was wondering if the members of the association had taken interest in this department, and whether, whenever they knew of any case of adulteration, they had brought it to the attention of the committee. It seems to me this is an important committee and the members of the assbciation ought to take an interest in this branch of the work, and help the committee give something practical to us. It seems to me this committee ought to be a more practical committee in its work, and I would like to do my part towards bringing matters before the committee which will make it a practical one.

President: The association has a list of queries to be presented at each meeting. I have not seen the list for this year.

Prof. Prescott: I don't know but the Committee on Papers ought to ask the pardon of the Committee on Adulterations, or its chairman, for presenting a good deal of matter which really falls within the province of the Committee on Adulterations. You will remember hearing yesterday afternoon that one division of the work of the School of Pharmacy was entitled Analyses for Adulterations. That report was presented as a part of the work, in abstract, of the students of the school. I would say that it has not seemed of very great consequence what our classification was so long as we got our matter into publication. A great majority that bears upon adulterations does not come under the head of the work of the Committee on Adulterations; that is true of all state societies and of the American Pharmaceutical Association. At the same time, I believe this society has been engaged in a general endeavor for some years to stimulate the work of the Committee on Adulterations. I am very glad that the gentleman who has just spoken suggested what he did.

Mr. Snow: I do not think the committee has ever presented a report exactly in the line suggested, and I may suggest that would be a pretty broad field. I do not think myself that in the matter of pharmacy there is very much adulteration, and although there might be adulterations existing in essential oils, liquors, etc., all degrees of skill are brought to bear in the manufacture of our preparations, and those are certainly within the province of the committee. I don't think it pays to examine mere odds and ends of samples from time to time as they come in. In other words, if we did work of that description, there would be no end to the work to be done. What I would

like very much to see done is to select certain lines which we know are likely to be deficient, and examine them. So if the association desires to make any special effort in that direction, we would be very glad to see that the samples are subjected to an examination.

Mr. Eberbach: It appears to me that this term "adulteration," as generally understood, is liable to misconstruction. I do not think we have so much to complain of in the way of adulteration in our preparations as we have in the matter of impurities in the natural drugs. Another thing that there are deficiencies in is the specific gravity, or concentration, and if the members of this association take any interest in that line of research, I think there could be a great deal of material during the course of the year gathered together that could be reported to the Committee on Queries, and they could bring in some practical papers, even though they were short, stating the conditions in which they were found. Such information would be of great value to the pharmacists of the state to guide them in making purchases. Our experience is to the effect that there is but very little adulteration carried out on the line of drugs.

Prof. Prescott: I would like to say in support of Prof. Johnson's report upon chemical assays that I do think it has a practical advantage after all, although somewhat indirectly so perhaps. It is very serviceable for the pharmacists and drug dealers to know what are the besetting impurities in different kinds of chemicals—both absolutely pure and medicinally pure. They are impurities to be guarded against as a rule.

Mr. Colman: I would like to ask the chairman of the Committee on Adulterations how much of that kind of work it would be possible or practicable for his committee to accomplish. I have thought at times that it would be an excellent idea if we could follow up some of these physicians' supply houses and getting hold of the articles they send out to physicians, determine what their impurities are—fluid extracts, etc., and be able to tell just how they compare in point of excellence with those turned out by other laboratories, such as are usually kept in drug stores. It is a matter that would be quite satisfactory to all of us. Of course that contemplates a good deal of work.

President: In the paper last night read by Dr. Vaughan he seemed to carry the impression that there was a great difference in preparations which were dispensed by pharmacists, and that is a matter of great importance to us.

Mr. Snow: Dr. Vaughan cited the instance of opium varying greatly in strength. The article of opium has been examined so frequently that we can predict what the per-

centage would be in almost every case, and I think it would be time thrown away to examine that. We know what variation obtains in the case of fluid extracts, and all that class of work is really out of the question for the committee to take up. The value is not in proportion to the amount of work required. There has appeared on the market a concentrated opium and full instructions are given for solution; four fluid ounces make a pint. I think it would be very desirable to examine into such a thing as that, and also the iodide of iron and every preparation of that kind.

Speaking for myself, I would prefer to have all my work in this direction together and know just what I could do, whether I could spend a week or ten days or two weeks, and whatever length of time it might be, spend that and have it done with. I could not very well, situated as I am, afford to spend much more time than that. I would be quite willing to devote the equivalent of two weeks' time to that work myself if the other members could do equally well.

Prof. Prescott: The School of Pharmacy would be very glad to do such work as it can that might be referred to it by the Committee on Adulterations. We should prefer to do it in that way, have it referred to us by that committee. We could do it better during the last half of the college year; that is, between February and June.

A Member: The chairman of the committee made a good suggestion that some particular line of work be taken up, and if the pharmacists of the state knew the line of work the committee was to take up, they could send whatever they had to the Committee on Adulterations in that line. About a year ago I had my attention called to Seidlitz mixture made by P. & W. and found it to include double the amount of carbonate that it ought to. That was quite a striking instance in something that I was not looking into very often.

Mr. Gundrum: In all probability if we are deficient in anything, it is more in quality. It is taken for granted by many druggists that if a thing is not adulterated it must be all right. Of course the jobber will buy where he can buy cheapest, and, of course, if the druggist is satisfied with such an article, that is all he cares about. Another thing that I would like to say particularly is in regard to that laudanum, tincture of opium, that Dr. Vaughan spoke of last night. I do not believe the quality of the opium is at fault for that variation. I do not think any opium would be allowed to be imported with such a variation as stated. I think the fault lies in the manufacture. Since I have been on the board of pharmacy my attention has been drawn to the fact that even the students, who have studied and come up for

examination, know very little about this matter, in half the cases they have not studied it. I think that in a great many instances the laudanum is made by maceration and by running it through filtering paper, and that may account for its variation in many cases.

Prof. Prescott: I remember a report of the Committee on Adulterations in the New York Pharmaceutical Association about ten years ago, where there was a full report made upon the tincture of opium. You will find it in the journals for that year. It appeared from that that two customs were somewhat concurrent among the pharmacists in New York State. One was the keeping of a half strength laudanum for external use, and the intention was to make it half strength. Another was of using an avoirdupois ounce instead of a Troy ounce, making that variation from the official standard. I think it is the avoirdupois ounce instead of the Troy ounce that was employed for the full strength. I do not think this custom has ever obtained in Michigan. We have had some reports upon the current tinctures of opium in Michigan, but it seems from this example cited by Dr. Vaughan they are not doing any better in New York State than ten years ago.

A Member: The idea has often occurred to me that if retail pharmacists had some simple means of determining the more common adulterations to which drugs are liable, it would be a very good idea. If there was some simple means of determining these adulterations it would be a good thing. I don't know that there is anything of the kind. I would like to ask Prof. Prescott whether there is anything of that kind available for the retail pharmacists, a simple test for the more common adulterations of the more important drugs.

Prof. Prescott: I think the U. S. Pharmacopœia itself would furnish the test for strength. The assay method for opium in the Pharmacopœia is the one that is expected to be used by pharmacists generally, and is applicable to galenicals, alkaloids and drugs.

A Member: There are a great many drugs used in drug stores which are not contained in the Pharmacopœia, Paris green, for instance.

Prof. Prescott: I could hardly mention a small volume that would answer the purpose.

President: How about Hoffman & Power's Examination of Medicinal Chemicals? I have seen that used a great deal.

Prof. Prescott: That is good, perhaps as good a general work as any.

The association then took a recess until 1:30 p. m.

THIRD SESSION.

[October 21st, 2 o'clock p. m.]

President: Our first vice-president is in charge of a subject which may come up for discussion again at this session. Our second vice-president is busy, and I shall call upon our third vice-president, Mr. Vernor, to preside at this session.

Mr. Vernor then took the chair.

Chairman: I see by the program that the first business of the afternoon is the report of the Executive Committee. Is it the pleasure of the association that we proceed with the program, or shall we commence where we left off?

Mr. Parkill: I think it would be very satisfactory to commence where we left off this morning, as we had only disposed of one subject, and I will make a motion to that effect.

The motion being put, prevailed.

Chairman: Will you give us the next item for discussion on trade interests, Mr. Colman?

Mr. Wurzburg; As I understood it, the first item had not been fully disposed of.

Chairman: Had we not disposed of the first item?

Mr. Prall: I think not.

Mr. Colman: This morning we simply decided to send that communication to the National Wholesale Druggists' Association, and that was according to our first suggestion. We also recommended that the association express itself in that way to the proprietors and the wholesale dealers, and we were discussing it in a general way, I believe, when we broke up. I believe Mr. Wurzburg made a motion which should come in here.

Mr. Wurzburg: Mr. Eberbach made a suggestion which I think is a very good one, that wherever there is any cutting done on patent medicines we should not wait for action until our annual meeting before making it known, but according to his suggestion, it should be reported to a special committee, which, I think, should be the standing committee on trade interests, and let them look after it. In that way our association would be practically a league, doing what local societies do in different towns.

Chairman: Do you put that in a form of a motion?

Mr. Wurzburg: It seems to me the Committee on Trade Interests would be the proper committee to look after this matter. I will make that a motion to bring it before the association.

Chairman: It is moved and supported that any person having complaint of cutting shall report the same to the

Committee on Trade Interests. Of course, that would naturally be sent to the chairman of the Committee on Trade Interests if it came to the secretary of this association.

Mr. Wurzburg: I think in connection with that it would be a good idea to issue a circular to every druggist, notifying him who the Committee on Trade Interests are, and the authority given them.

Chairman: The resolution, if it appears in the proceedings, would be sufficient, would it not?

Mr. Wurzburg: The proceedings are not sent to enough druggists. Some years ago we adopted a rule of not sending the proceedings to any member who was in arrears for dues.

Chairman: It is moved and supported that the druggists of the State of Michigan be requested to send any complaint as to cutting to the chairman of the Committee on Trade Interests.

The question, being put, prevailed.

Mr. Colman: Do you want to do anything on this other recommendation? Do we wish to say anything to the Rebate Committee and to the wholesale trade, requesting them to refuse to sell goods to cutters, or do we wish to make any other request of them? Do you wish to pay any attention to that in this connection? We say that we promise our support to these rebate proprietors, and also to the wholesale dealers who comply with the request of the National Wholesale Druggists' Association.

Mr. Wurzburg: I move that the regulation be adopted.

Chairman: Does the recommendation mean that we pledge the members of this association to that.

Mr. Colman: I should say it would mean that we pledged ourselves to the proprietors of rebate articles; that we would give their goods preference over those of dealers who paid no attention to us. It would also be equivalent to promising the wholesale dealers that we would discriminate in their favor, all other things being equal, as against those who paid no attention to our expression. If you have dealers in Detroit, and they have been asked not to fill orders of persons known to be habitual cutters, and you have one jobber who complies and another who does not, who says, I will fill my orders no matter where they come from, under those circumstances we promise to stand by the man who stands by us.

Mr. Parkill: I think if we instruct the secretary to send the same resolution to manufacturers that we send to the National Wholesale Druggists' Association, the action would be broad enough to meet the demands of the case.

Chairman: Do I understand that you make that motion to amend the resolution of Mr. Wurzburg?

Mr. Parkill: No, I don't. Let's discuss the question. The motion now is that we virtually adopt the wording of the report of the committee.

Mr. Colman: I think perhaps Mr. Parkill's would cover it all and convey to all proprietors the idea that we care to convey at this time.

Mr. Wurzburg: I think very likely Mr. Parkill's suggestion is a good one, and I would accept that as an amendment or a substitute for my motion.

Chairman: The original motion to concur in the recommendation is withdrawn, and in place of it the motion is made to transmit to the retail proprietors and wholesale druggists this recommendation.

Mr. Parkill: My idea was to have this sent to the manufacturers of proprietary articles who are acting in harmony with this arrangement. It seems to me that there is a Manufacturers Protective Association?

Mr. Parsons: It is the association of Manufacturers and Dealers in Proprietary Remedies in the United States.

Mr. Parkill: Mr. Kline is the secretary, is he?

Mr. Parsons: No, Dr. R. V. Pierce is president of that association, and I think Mr. Bowen is secretary. Mr. Kline is secretary of the committee of the N. W. D. A.

The motion was then put and prevailed.

Mr. Colman: The next recommendation is with reference to toilet articles, recommending that we discriminate against those who sell to fancy stores. My own idea is that if we take one thing at a time perhaps, we shall accomplish more. As to the matter of patent medicines, I feel quite hopeful, and I find in talking to some of the other members, that while they think something might be done with reference to patent medicines, they do not feel so hopeful about toilet articles. Perhaps it would be better to wait. Still that suggestion is before you, and it is in order.

Mr. Parkill: I think we would be shooting a gun in the air if we should adopt that suggestion. Those things are on the market, and I do not see there is any possible hope in trying to control the trade in those articles. As a fact, department stores and others sell more of them than druggists anyway. I would not think it best to weaken our efforts by taking action on this matter.

Chairman. And yet there are manufacturers of such articles who are working into the hands of the druggists, like Ricksecker, who will not sell to department stores. Perhaps they should have some recognition.

Mr. Peck: We had an experience in Grand Rapids with reference to toilet articles. Our local society appointed a committee to call upon the dry goods stores and endeavor, if possible, to have them refrain from keeping those goods. The idea was to buy out their stocks, if they would agree to quit, and Mr. Wurzburg and myself were on the committee, but the concerns all refused to sell. Our next alternative was to advertise those articles in all the papers at the prices established by the stores, and the advertisements were paid for by the druggists. They continued to sell for some length of time, but it had the effect, not only to reduce the sales, but also to deter them from putting in patent medicines, because we informed them if they put in patent medicines we would do the same. The result is that they sell some toilet articles, but do not keep medicines, because they know we would advertise them at the prices they offered them at. This has had the effect of keeping proprietary medicines out of the stores. Of course, that might not apply to small places, but I think they might be combated in that way better in larger towns than any other.

Mr. Hall: I would make a motion that we, as members of this association, pledge ourselves to support those manufacturers of perfumes, cosmetics, and so on, who discriminate in favor of druggists; those who do not and will not sell to department stores, who confine their trade exclusively to druggists. That we give them the preference, and that the secretary be instructed to send a copy of this resolution to the several manufacturers as far as he can find them out.

Mr. Colman: Returning to our first suggestion with reference to the matter of cutting prices, placing the latter in the hands of the Committee on Trade Interests, and inviting the druggists throughout the state to inform them of any violation, I will say that I do not know that we have instructed the Committee on Trade Interests to do anything further than to accept the information that was given, have we?

Chairman: I think not.

Mr. Colman: Ought we not to instruct the Committee on Trade Interests what to do? I would suggest that we return to the consideration of that point for a moment before going any further.

I move that the Committee on Trade Interests be instructed to investigate carefully any complaints made to them relative to cutting, and to use their influence as their judgment may direct to do away with cutting, and in case the parties complained against will not do so, to report the names of the cutters to the National Wholesale Druggists Association.

Mr. Parkill: Should there not be something in there concerning the sending out of a circular to all members of the association throughout the state?

Mr. Colman: Mr. Wurzburg's motion I think included that.

Mr. Parkill: Did it?

Mr. Wurzburg: Yes. Is it sufficient to send it to the Wholesale Druggists Association? Isn't it necessary to send it to the association Mr. Parsons spoke of, what was that called?

Mr. Parsons: The Association of Manufacturers and Dealers in Proprietary Remedies of the United States, which includes all the principal proprietors.

Chairman: I think this resolution is broad enough for the instruction of the Committee on Trade Interests.

The motion being put, was carried.

Mr. Colman: The next subject for discussion is the question of the dispensing by physicians of medicine, and the sending by physicians to supply houses for their medicine. We make no suggestion upon that, but we say that it is a greater evil to-day than ever before. We suggest the propriety of discussion upon this subject to see if we can accomplish anything.

Mr. Hall: I think the suggestion made by Mr. Eberbach this morning that samples of these preparations be submitted to our Committee on Adulterations is a good one. In this way we might know whether the articles furnished are up to the standard or not. If we should find they were below, we could then bring more pressure to bear on physicians than otherwise. If it is necessary in order to get the matter before the association, I would make that motion.

Chairman: I don't exactly get the motion. Do you move that samples be furnished to the Committee on Adulterations?

Mr. Hall: The idea was to have samples obtained of these articles to be sent to the Committee on Adulterations, that they might examine them and report upon them, so that we, as members of the association, would have a knowledge that we could use with the physicians in our localities against those preparations.

Chairman: As I understand it, the motion would be that members of the association in districts where physicians furnish remedies to their patients, procure those remedies and furnish them to the Committee on Adulterations for investigation.

Mr. Hall: Yes, sir.

Mr. Parsons: There was a paper read by Prof. Patch before the American Medical Association at Washington,

showing that articles furnished were very much off the standard. The physician sometimes prescribed sulphates when the label said he was prescribing chlorides, and other things of that sort.

Mr. Eberbach: I think the motion as made is rather a broad one for this association to endorse, because that would necessitate the installation of a corps of chemists to do the work. The able address given us last night by Dr. Vaughan pointed out the relation that the regular physician stands in to the pharmacist. The few articles that Dr. Vaughan referred to last night as being deficient, for instance, tablet triturates, show it to be really the duty of the pharmacist to examine into those preparations and know what they are. I think we are all aware, and I know the State Board of Pharmacy is, from their experience of the last two years, that the condition of pharmacy in the State of Michigan is not up to that standard that we should demand. I think the scientific pharmacist should make these examinations. I think that the only way this matter can be controlled is by the pharmacist getting into closer relations with the physicians of his locality, and proving to them that the pharmacist can furnish the material he desires, which shall be up to the full standard and of reliable quality. Of course, they will have to adapt themselves in a mercantile way to certain prices that may be a little lower, but it is better to retain the good will of the physicians than to lose their entire patronage. If this association intends to take steps to improve our relations with the medical fraternity of this state, the association itself should adopt some plan by which the preparations of more potent remedies, like morphia, strychnia and others, shall be subjected to analysis, and the result of these analyses published in the proceedings. In this way the profession at large would have a chance to get an understanding of the quality of the different materials, and at the same time the physician would be given that protection that pharmacists are in duty bound to give the regular practitioner. The question is whether a plan of that kind would not be beyond the means of this association to carry out. It is a question whether this association could afford to employ qualified chemists to take up the matter and make such analyses. Whoever undertakes to examine and report a shortage on an article must be some one who is thoroughly competent and careful in his manipulations, and it must stand the test in case they question the correctness of it. That is a point this associatiou will have to take into consideration before they go too far with any movement of that kind.

Chairman: There was no intention of making any expense to the association in connection with this. The idea was that the retailers furnish the Committee on Adulterations material upon which to work.

Dr. Prescott: Mr. Snow spoke this morning upon that point. I take it that in this case the Committee on Adulterations would have to limit the amount of work they would do. They could not promise to examine every article sent to them. As I said before, I should prefer that the School of Pharmacy should make such analyses as they did make, of articles submitted to them by that committee, or some other responsible committee, so that the labor would be expended upon material where it would do the most good. The results of the work should be collated and work should not be duplicated. The amount of work done would be as large as possible. I think if this resolution should be passed, that the Committee on Adulterations would not be able to make an examination of all articles presented.

Mr. Parkill: Has any one any supposition that the articles furnished by these houses who deal with the physicians are inferior in any way to those furnished by the regular trade? We are going on the assumption that they are, but has anybody any idea that they are?

Mr. Eberbach: I have no definite information, but there was a statement made last night by Dr. Vaughan, which was certainly right to the point, when he claimed there were such preparations on the market.

Mr. Parkill: Not articles furnished by the wholesalers directly.

Mr. Eberbach: The question touches upon our relations with physicians, and if we can show to the physicians that some of these articles are short in weight or quality and show to them that we are looking after those things, I think a great many of them would go to the druggists before going to outsiders.

Mr. Anderson: Mr. Parkill asks if any one has any definite information in regard to physicians' supply houses. I happen to know something about one or two of them that are making a specialty of supplying physicians with these goods and ignoring the retail trade. These two or three houses I have in my mind are supplying goods that are about the same as the retailer buys. They buy the most of their goods of the larger manufacturing houses, the same as the retailers, and therefore their supplies are about the same. I think the association would make a mistake in entering into this opposition to the physicians' supply houses on the ground of quality. I believe that the quality of the goods supplied by these houses will average fairly well, if not up to the quality of the goods furnished by the retailer. I think the only way of competing with them is to find out what the physician wants and then go to him with a line equally well fitted to his wants, and if the prices are equal, there is no reason why he should not treat with the pharmacist.

I don't think on the ground of quality you can draw trade away from them.

Mr. Parsons: It seems to me the best thing is to look after ourselves first. "Let the one without sin among us cast the first stone." Possibly we may find these houses are doing better by the physicians than we are.

Mr. Parkill: The laudanum spoken of by Dr. Vaughan comes from the retail shops, perhaps preparations made by ourselves. If we go into this thing too deeply, it may result as a boomerang.

Mr. Colman: You will remember that I asked the chairman of the Committee on Adulterations this morning how much work that committee could do for us. I said we would like to know what the quality of goods was that these houses were getting out. If we found them all right, or better than those we have on our shelves, we don't need to say anything about it, until we know to a dead certainty that we have them short. I have been told by physicians who have bought their goods from supply houses that they thought they were inferior. I have also been told by a man in the employ of one of those houses about their manner of preparing those things. He may not have told me the truth. I don't know about that. At the same time, if we could, without requiring too much of this Committee on Adulterations, ascertain what these articles were, it would do us no hurt, and if we found they were good we needn't say anything about it, but if we found they were wrong, we would have a strong lever to bring the physicians onto our side. I am of opinion after all, that the remedy must lie almost entirely within ourselves. The only way we can hold the physicians' trade and the painters' trade is to get on the right side of them and make them have a friendly feeling towards us, and if possible make it a financial object for them to buy of us. At any rate, make it so it would not be a financial disadvantage to do it. I think in Kalamazoo the druggists don't pay much attention to the physicians, and the physicians don't take pains to find out what kind of a stock we carry. In a measure we can correct that by showing them that our goods are of a good quality, that we have a full stock and that the prices are reasonable. I have tried that policy in the case of a few physicians and found it worked all right. At the same time, if I could just say to them, "Now, of course, doctor, you want good goods, and on our shelves we have got goods from Parke, Davis & Co., Squibb, and others, and you have been buying of this and that house and we have found that their goods have been tested and they turned out so and so," that would be some help to us.

Mr. Snow: It seems to me the chief objection lies here. You may find a certain percentage that may not be up to the standard, but that does not establish that they are not

correct. I think the committee could not do the amount of work contemplated. If there were only to be a few tests it would be another matter. As soon as you get us into organic analysis you sometimes need a whole day on a single article, and that class of work I do not think falls properly within the province of this committee. And if it were done, it could only be done by examining a large number of samples to establish a satisfactory guide. I think as far as that is concerned what Mr. Anderson said was about right. As far as my information goes, these stores furnish pretty much the same drugs as the rest of them.

Mr. Prall: I think this question of dealing with physicians depends largely on the management of druggists and the astuteness of the salesman. I do not believe any physician can afford to hire the expert assistants we have to hire, and that he can conduct as thorough and perfect a pharmacy as we can, but if we use that argument only he is going to make the trial anyway. Most of them, I think, go into the supplying of their own medicines for the money there is in it. Some of them are inclined to buy the cheapest they can get, and others buy the best they can get, and I think the only course for me to pursue is to endeavor to get their trade at a smaller margin than I ordinarily get for prescriptions.

Secretary: It seems to me this is a good deal of a local matter. The physicians in my place might be handled differently from the physicians in your town. I have found it a good thing to stand in with physicians in every way I can. I have had them come into the store and blame me because I sold patent medicines and injured their trade. A little instance of that kind occurred recently. One of the leading physicians came in, and while he stood there a person came in and bought half a dozen bottles of Warner's medicine, and he said, after the man went out, "It is such things that beat us physicians, if you would stop selling patent medicines, we would have something to do." I made no reply, and as he passed out he threw down a prescription he had been writing, and said "Send it over to Smith's house," and when I came to it, it was for one bottle of Fellow's Solution of Hypophosphites. It seems to me that druggists stand too much in awe of the physician. We don't stand upon our own mettle enough; we have a profession that stands equal to that of the physician's every day in the week and twenty-four hours in the day.

Mr. Hall: The only object I had in making this motion was to bring it up for discussion. I had no particular desire to have it passed. Our secretary has given his experience and I will give a little of mine. One of the physicians in our place was prescribing more or less of syrup of figs, Buckthorn cordial, and one thing and another, and I

quietly went to work and found out what he wished to prescribe, and made a preparation to fill the same want. I brought it to his attention and he tried it, and the result was, so far as I am concerned, that where he would perhaps write half a dozen prescriptions, calling for these proprietary articles, now he has adopted my preparation and I don't have over one of the other now where I had half a dozen before.

Secretary: That member is guilty of substitution.

Mr. Hall: I may say that the preparation seemed to be about what he wanted. I took one of the elixirs of the National Formulary, slightly modified it, I think, and added a little Buckthorn. With the consent of the association, I withdraw my motion.

The resolution was withdrawn by consent.

Mr. Colman: The next question is the liability of the employer for mistakes made by the employe.

Mr. Bassett's idea last year was that after the proprietor had complied with the law his responsibility should cease, and if the responsibility belonged anywhere, it was on the state. Mr. Pauly told us that in Germany that was the condition of things, the employer was not responsible for the employe. This question started some discussion last year, but we hadn't time to continue it, and it occurred to me that perhaps we would like to continue it this year.

Mr. Prall: I would like to hear the suggestion contained in the report of the State Board of Pharmacy read.

Chairman: It was in the report of the Committee on Legislation.

Mr. Parkill: Of course any action taken concerning this must be taken through the legislature, which will not be in session until another year, and as the association will meet before that time, it might be well to postpone its consideration.

Chairman: I think the point is very well taken. I think when we employ a registered pharmacist, who is authorized to do business under the laws of the state, we have gone to the limit and have done all we can. Do you make that a motion.

Mr. Parkill: I move that it be referred to the Com mittee on Legislation for report at next meeting.

Carried.

Mr. Colman: The last suggestion we have to make touches upon the qualifications of the clerk to put on labels and tie up packages. We have a great many clerks in our stores who graduated at Ann Arbor and who have been passed by the State Board of Pharmacy, who cannot tie up packages in a decent manner. In this connection I would like to ask Mr. Peck what system he has of keeping track with employes. I understand he has some such system.

Mr. J. E. Peck: We have about fourteen people in our store, and of course a good many incidental errors creep in. Some of them entail considerable loss, as we do something of a wholesale business. There is a breakage occasionally, sometimes there is an error in sending out a package. We have found by experience that the better way of placing those things is not by annoying one's self, or annoying the clerk, so we enter in a book, called The Mistake Book, the name of the clerk who makes the error, and the details. We also enter the trifling incidental mistakes, in fact any errors by which the business may be rendered more or less unpopular by the action of the employes. The result is that since pursuing that policy these mistakes have diminished fully 50 to 75 per cent. and now they are very rare. At the end of the year the errors in the book are copied off on foolscap paper and at that time we know who is the most useful and careful. In this way we raise the standard of our employes, very much to our own profit.

Chairman: I heard that statement made last night and I thought it a very good idea. Mr. Peck stated last night that when one of his clerks smashed a bottle of material he would rather come forward and pay for it than have the book pulled down and his name entered in it.

Mr. Colman: We make this suggestion, that proprietors not only keep a book, but keep an account of a man's record that they should report to the secretary of this association. Here is a man that comes to me and applies for a position. He is a graduate of this school, he has been passed by the Board of Pharmacy, and he is a registered pharmacist. I say. "Do you write a fair hand, and can you write a label well?" "Oh, yes, pretty fair." "You are careful about breakages?" He says, "Yes." But I haven't any way in which I can find out about the matter. Of course I can write to the man who employed him last, but it would have a wholesome influence on him if it was known that he was making a record all the while, to be preserved, somewhere in the records of something. If he is a careless fellow and smashes things around, if he does up packages loosely, let him know it is known, not only to the man whom he works for, but to the one he goes to next also. It was in view of this that we made the suggestion that some such arrangement be made whereby we would report once a year to the secretary of this body, in a general way, the merits and demerits of our employes.

Prof. Stevens; Would it not be a good thing to add to that the merits and demerits of the employer?

Mr. Colman: That would be a most excellent idea undoubtedly.

Mr. Eberbach: I would like to know whether it is the

sentiment of this body that the standard of examinations of the State Board of Pharmacy ought to be raised; whether they would like an examination on such points as penmanship and the putting up of packages?

Mr. Colman: I should be in favor of it most emphatically.

Mr. Gundrum: I would like to ventilate my experience on the board. I think there are men who enter into the drug business whose penmanship needs looking into, and I should like to have this body talk a little on that subject. There are some men who go into business that it would seem ought to write a fair hand before they are admitted.

Mr. Prall: In some of those old Philadelphia pharmacies they not only give attention to the little details, but the proprietors are the conservators of the clerk's morals. In some stores, where they donate the total amount of Sunday sales to the church, the clerks have to be in bed at 9 o'clock, but the method in Wisconsin of keeping the boy in nights is to drive a stake through his body, as I understand.

Mr. Peck: I think Mr. Gundrum's point is well taken in relation to penmanship, because some of the boys write about as bad as the doctors. It certainly is rather discreditable to have a prescription well put up and badly labeled, and that is one of the things I am bound to contend against. It seems to me it might be impressed upon the young men who apply for places that they should improve their writing.

Mr. Parkill: If anything is to be said concerning their qualifications for outside matters, it would seem to me to be better to institute an examination in some of the rudimentary branches. An understanding of arithmetic would be better than the mere ability to write a good hand. I would like to have this matter discussed, for I would like to hear the opinions of the people here on this subject.

Mr. Prall: It is more important that he should write a good hand than that he should understand arithmetic.

Mr. Vernor: Some of the persons who have passed the board write nearly as badly as physicians. I will say that we have not had a single one pass the board whose writing we couldn't read.

Mr. Peck: I shall have to qualify it then by saying that they write nearly as bad as physicians.

Mr. Springer: In my limited experience with drug clerks I have had some trouble. I had one last summer a little while, who was a graduate of the School of Pharmacy, and in doing up a little package it generally looked as though it had been done up by some apprentice in a grocery store. I think if the board of pharmacy would supply some flaxseed and senna and let them practice on it it would do

them good, and if it is done up slovenly, they ought not to be permitted to do anything of the kind.

Prof. Stevens: I think the point is an excellent one. We insist upon it and they are given some of that work to do here. In many instances the packages are returned to be done again. Usually they will do them well, but after they have left here we can't control them. As has been stated, if they felt they were dependent upon the manner in which they did their work for their place, and they had to take such an examination before the board, it would make it very much easier for us to teach the boys. It seems to me it is perfectly legitimate to require that as a part of the business of a druggist.

Mr. Parkill: The idea of the law, in the first place, is the protection of the public, and that the board shall require that the students shall know enough about the business so that there should be no mistake. The mere mechanical work of tying up a package has nothing to do with it. A man can wrap up a parcel in any manner he pleases. As long as he puts up the right thing in the right quantity that is all right and as far as we can go. The matter of putting up a package in a drug store has nothing to do with it, and the thing can be corrected in very short order by the druggist himself. The idea of sending a lot of fellows up to a table to do up parcels and to see that the strings are cut off just so, I think is sheer nonsense as far as the board is concerned, and under the law we have nothing to do with it.

Mr. Prall: I do not think it is sheer nonsense. While the law is for the protection of the public, we want them to have, not only the assurance of this board that these men are all right, but we want them to feel they are safe, and they will feel a great deal safer when a package is done up neatly.

Mr. Snow: I think if I were a young man who went before the Board of Pharmacy and was plucked because of the manner in which I did up a package, I would commence proceedings to have my certificate granted me.

Mr. Colman: How else are we to get at it? I don't believe the board has anything to do about this matter, as to whether they are elegantly or inelegantly tied up. I think, as has been said, that that can be corrected in half an hour by the druggists themselves.

Mr. Vernor: I suppose that Mr. Parkill considered that it didn't take half an hour to discharge a man.

Mr. Colman: What I was getting at was that we should give each man to understand that he was making a reputation, and that if he was a painstaking, accurate fellow, it would be to his advantage, and if he got a certificate from

the board as to such qualifications, it would perhaps have more weight than his certificate.

Mr. Gundrum: I don't think the board can guarantee to furnish material for this state that is A No. 1 out of all sorts of boys. We might as well go to work and teach them how to wipe off show cases and black their boots and clean their teeth in order to make gentlemen of them.

Mr. Caldwell: I think the whole matter rests with the proprietor. In the first place, he ought to take the apprentice when he comes in and teach him this, and if he finds he is a poor writer tell him to go and learn to write. A boy commences with some druggist to learn the business, and in two or three years he is advanced to do up prescriptions, and by that time he ought to be able to do it well. The majority of these poor clerks are turned out in some other way, and with proper care during their apprenticeship I think these faults can be remedied.

Prof. Stevens: We often find that those who are the hardest to teach in the matter of doing up packages, &c., are those who have served a partial apprenticeship, perhaps in some grocery store. We can teach them to do up the package for the time being and they can do it well enough to complete their work, but after they go out from this institution they fall right back into the habit they had learned previously in some store. We can teach them how to do it, but we cannot follow them out after they leave here. I merely want it understood that they are taught here, but whether they continue to do it afterwards I don't know. That is a matter over which the proprietor has control, and it is for him to insist upon its being done properly.

A Member: I remember one instance where a clerk could not make up a good package to save his life. I have seen cases where young men were taught, or attempts were made to teach them, and they never could learn it. I know of one young man who worked twelve years in a wholesale business, doing up packages all the time, and to-day he is not able to do a good one.

(At this point should be inserted the following letter, bearing upon the topics of discussion, but received too late to be read at the meeting.)

Mr. H. G. Colman, Kalamazoo, Mich.,

DEAR SIR—Yours of September 25th was duly received and contents carefully noted. I confess that *my own* "trade interests" have absorbed so much of my time that I have not found time to give the subject much consideration. It seems to me that the committee on "Trade Interests" have a huge contract on hand. Does not everything that pertains to the business look towards the profits of buying and selling? We are supposed to recognize a certain amount of so-called "ethics" in our relations to each other and the physician, but practically it is reduced to a mere shadow of a thing, and the same rules of supply and demand seem to regulate our traffic as apply to other branches of trade. This seems to be the natural outcome of the separation of the physician from the pharmacist.

The time is not very distant when the apothecary was the family doctor, but such is rarely the case nowadays. Druggists are getting to be more

and more simply traders, so that "trade interests" seems to cover pretty nearly the whole ground.

In regard to the cutting of prices (among druggists). I think the only remedy for that is union and co-operation. Where that is done by other lines of trade, the manufacturers and jobbers are the only ones who can regulate that.

The matter of physicians' supply houses, it seems to me, is something we can hardly expect or hope to control. This being a free country, it does not look as though we could dictate very much to such houses to whom they are to sell, or to physicians of whom they are to buy. The only remedy I could suggest is for the retail druggist to constitute himself a physician's supply house and cater to the demands of the physician by supplying him what he requires at reasonable prices, and diverting his trade into the home channel from the foreigners. We cannot force the physician to prescribe if he prefers to dispense, and if we attempt it, he will "dispense" with our services entirely. If we can convince him that we can supply his wants at a small margin, and still as cheaply as he buys outside, we have won half the battle and paved the way for more peaceable and friendly relations, and he is liable to relax his strained position and write a prescription occasionally to keep in practice and keep the good will of the druggist. Personally I have known of several cases where physicians have actually been frozen out and forced to dispense their own medicines in order to get just what they wanted. Candidly I think the druggists are largely to blame for the condition of things in some places, and they are the ones to rectify it in their own locality.

Again, in some localities the regular physician is compelled to furnish medicines by the Homeo. school who happen to be in sufficient numbers and strength to *control* to a certain extent the business. Sometimes the *mild power controls* as well as *heals*.

And, again, I have had personal experience in localities where very few of the physicians were really *competent* to prescribe intelligently and, *must I admit it*—I have known some localities where there was *not a single druggist* who was really competent to dispense—either from ignorance, cupidity or carelessness. The incompetency of the druggists has had more to do with physicians dispensing than any other one cause. But, of course, our pharmacy law is steadily raising the standard in our profession, and the same remark applies to physicians in the state, so we may live to see the day when ignorance and incompetency will be a thing of the past in both professions.

In regard to the responsibility of druggists for mistakes of clerks. It is a subject I have never given any thought, but I think Mr. Bassett's position is about right. If the state licenses men to dispense and we use reasonable care in selecting employees, the state ought to be held responsible for errors committed by such licensees.

Right here let me call attention to an evil which should be mitigated or abolished, viz., that of giving recommendations to clerks who are not *desirable* either from incompetency, dishonesty or any other cause. I have seen clerks loaded with profuse recommendations from prominent druggists who were not in any sense entitled to them. A dishonest or incompetent clerk should be obliged to seek his proper level, and the sooner the better. Let us protect ourselves and each other in this respect, and weed out the black sheep.

I am writing at greater length than I anticipated, but presume I have said nothing but what has been said before "many a time." I sincerely regret that I have had so little time to give to this subject, and also that my business appointments make it impossible for me to attend the meeting at Ann Arbor this week. I had intended doing so, but I find just now that I cannot get away. Am sorry also that I cannot give you any new pointers or subjects for your report.

Trusting you will have a full attendance and profitable meeting, and that the trade interests of the pharmacists of Michigan will be properly looked after, I am, Sincerely yours for protection,

Bay City. CHAS. W. HULL.

Mr. Colman: There is no question before the house I think. I ought to say that Mr. Hull and Dr. Ward are not responsible for these suggestions, and if they are impracticable or visionary, I must father them. I am glad of one thing, that they have provoked discussion. There is a suggestion here from Dr. Ward with reference to requiring proprietors of patent medicines to put their formulas on their bottles.

Prof. Stevens: I think it would be well to refer that to the Committee on Legislation to see if some law cannot be passed to accomplish it, and I would make that as a motion.

Carried.

Chairman: The next business in order is the report of the Committee on the President's Address.

Mr. Parsons: We have found, in looking over the address, that it consists of a general review of the questions now at issue before the drug trade. It contains but one special suggestion and that suggestion has been pretty well covered by the resolution you passed yesterday. It relates to the hiring of an attorney by the State Board of Pharmacy. The president suggests the propriety of memorializing the legislature to authorize the employment of such an attorney. You passed a resolution yesterday referring this matter to the Legislative Committee, who will have to bring it up next year, there being no legislature to take action upon it now.

The committee has to report that they approve the suggestions made by the president with reference to trade interests and the suggestions he makes generally.

On motion the report of the committee was accepted and adopted.

Chairman: The next business in order is the report of the officers. We will listen to the report of the secretary.

SECRETARY'S REPORT.

To the Members of the Michigan State Pharmaceutical Association:

In presenting to you a report of my work as your secretary for the year just closing, allow me first to heartily thank you for support given and courtesies shown. The proceedings of our eighth annual meeting were mailed about January 1st last. About April 1st I mailed to the members the protest circular and blank as suggested by our president. Again the latter part of April I mailed more of these protests, each time writing many letters urging prompt action. In the collection of dues, I feel I have been fairly successful, but would urge upon members a quicker response to same. Mr. Parsons of the ERA, Mr. Boehnlein, of Williams, Davis, Brooks & Co., Mr. Peck of Hazeltine & Perkins Drug Co., Mr. J. J. Dooley of H. E. Bucklen & Co., volunteered to help collect back dues. The latter has collected $125 for the association. His work has also been helpful in furnishing me with changes in address of members, and also deaths among them. Two questions it seems to me might be discussed by you, viz: A mode of collecting the dues which will bring a readier response, also how can we best increase our membership. I might also urge upon members to inform the secretary of the death of any members and of changes in P. O. address.

C. A. BUGBEE, Secretary.

RECEIPTS.

Membership fees and certificates	$ 52 00
Advertising in proceedings	122 50
Annual dues	612 00
	$ 786 50

DISBURSEMENTS.

1890 Dec. 4th to Wm. Dupont, Treasurer	$ 20 00
1891 Feb. 10th " " "	208 25
" May 12th " " "	25 00
" June 24th " " "	15 00
" Aug. 7th " " "	109 00
" Sept. 7th " " "	155 00
" Oct. 19th " " "	76 00
" " " " " "	8 00
" " 21st " " "	170 25
	$ 786 50

On motion of Prof Stevens, the report of the secretary was accepted and referred to the Executive Committee.

On motion the usual memorial page was ordered printed in the proceedings as to deceased members.

The treasurer reported as follows:

TREASURER'S REPORT.

Ann Arbor, October 21st. 1891.

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION.

1890	RECEIPTS.		Dr.
Sept. 17th,	To cash on hand		467 11
Dec. 4th,	" "	20 00	
1891			
Feb. 11th,	" "	208 25	
May 13th,	" "	25 00	
June 25th,	" "	15 00	
Aug. 8th,	" "	108 00	
" "	" "	1 00	
Sept. 8th,	" "	155 00	
Oct. 19th,	" "	76 00	
" "	" "	8 00	
" 21st,	" "	170 25	786 50
			$ 1,253 61

1890	DISBURSEMENTS.		Cr.
Sept. 18th,	By paid H. J. Brown, No. 1	225 00	
" "	" " D. E. Prall, " 2	50 00	
" 30th,	" " H. Whitaker, " 3	50 00	
Oct. 22d,	" " D. O. Haynes, " 4	38 75	
" 27th,	" " Calvert & Co., " 5	10 00	
Nov. 15th,	" " H. J. Brown, " 6	8 00	
Dec. 4th,	" " C. A. Bugbee, " 8	18 79	
" 5th,	" " D. O. Haynes & Co., No. 9	7 00	
" 12th,	" " J. E. Beal, No. 7	42 25	
1891			
Feb. 11th,	" " Cheboygan Democrat No. 10	200 00	
" "	" " " " " 11	8 25	
" "	" " C. A. Bugbee, No. 12	34 00	
Oct. 21st,	" " Cheboygan News, No. 18	5 00	697 04
	Balance on hand		556 57
			$ 1,253 61

RECAPITULATION.

1890	RECEIPTS.	
Sept. 17th, Balance on hand		$ 467 11
Oct., 1891, Amount received since		786 50
		$ 1,253 61
1891	DISBURSEMENTS.	
Oct., Amount paid out		697 04
" Balance on hand		556 57
		$ 1,253 61

Respectfully submitted,
Oct. 21, 1891. WM. DUPONT, Treasurer.

On motion the report of the treasurer was accepted and referred to the Executive Committee.

REPORT OF COMMITTEE ON REVISION.

To the Michigan Pharmaceutical Association:

Your committee to submit contributions to Pharmacopœia Revision Committee, would respectfully submit.

After careful consideration it was decided that your committee could do no better than send to the chairman of the U. S. P. Committee of Revision, a complete set of the proceedings of the association, together with the printed index furnished this association by Dr. Prescott last year, at the same time calling his attention to certain articles that had special bearing upon pharmacopœial subjects.

In return we received a letter from the chairman, Dr. Chas. Rice, from which the following extract is taken.

"In forwarding the printed index to the valuable papers contained in the printed reports, you have rendered a great service to this committee. It would, indeed, be difficult to find a set of State Pharmaceutical Association Reports so replete with important papers as that from Michigan. I can assure you that faithful use shall be made of them. I am about to issue a circular in which I shall report your contribution to the committee and draw attention to the contents of the index, so that each member, according to his needs, may send to me for the paper he desires to make use of. If it were possible to obtain another set of the state reports, I would put each paper into a separate cover, so that one member would not have to wait until another one got through with the volume containing it."

In answer to Dr. Rice's letter, a second set was sent him. A short time since the chairman of your committee sent Dr. Rice a few abstracts from the theses of the students of the school of pharmacy in compliance with a request made by Dr. Rice to Dr. Prescott.

Respectfully submitted,
A. B. STEVENS,
H. W. SNOW,
O. EBERBACH.

Chairman: The suggestion is made that the proceedings be made as full as possible, and it is requested that members who have any suggestions, or alterations in the National Formulary be asked to submit them to the committee.

The Executive Committee then reported that the accounts had been examined and found correct.

The report was accepted and adopted.

The association then took a recess until 7 o'clock p. m.

FOURTH SESSION.

[October 21st, 7 o'clock p. m.]

The association was called to order by the president.

President: Has the secretary any miscellaneous business to report?

The secretary reported that he had received a communication from Mr. T. H. Hinchman, which was read; also a communication from the secretary of the Wholesale Druggists Association, notifying this association of the delegates appointed by that body, consisting of Mr. A. S. Brooks and Mr. John M. Hinchman.

The secretary also presented a communication from Mr. C. S. Hallberg, of the Illinois Pharmaceutical Association, calling attention to the pharmaceutical congress contemplated to be held in 1893, and asking the expression by this association of the name of some European city in which it should be convened. Mr. Hallberg suggests that Chicago be substituted.

Mr. Vernor: I understand the circular calls for the naming of some European city, and it seems to me that Mr. Hallberg's letter is not at all in line with the circular. The circular calls for a convention in Europe and not for a convention in Chicago. I do not think it would be a fitting thing for us to name Chicago in response to that circular.

Mr. Parkill: I move, as between the two places suggested, that it is the sense of this association that it be held in Prague—but if possible that it be held in Chicago.

Mr. Vernor: I move the communication be accepted and placed on file.

Both motions were carried.

The secretary also submitted a letter from the Illinois Pharmaceutical Association, giving the names of delegates sent from that association to represent them at this meeting, Mr. Louis E. Smith and Mr. Charles S. Feldkamp.

Also a letter from the American Pharmaceutical Association, extending an invitation to the druggists of Michigan to become members of that association.

Both communications were accepted and ordered placed on file.

The secretary also submitted a letter from the secretary of the section of Materia Medica of the American Medical Association, stating that the secretary had been instructed to inform the different states that the sessions of this body were open to all druggists, and that they were welcome.

The communication was accepted and placed on file.

President: The next business in order is the election of officers and delegates. I will appoint Messrs. Anderson and Stringer tellers.

On motion of Dr. Prescott, the order of business instituted last year, making the vice-presidents chairmen of the different committees, was abolished.

On motion the association proceeded to an informal ballot for president.

The tellers announced the result of the ballot as follows: Mr. Colman, 19; Mr. Parkill, 9; Mr. Caldwell, 5; Mrs. Taylor, 4; Mr. Peck, 1; Prof. Prescott, 1; Mr. Vernor, 1.

On motion the association then proceeded to a formal ballot for president, which resulted as follows: Mr. Colman, 23; Mr. Parkill, 17; Mr. Caldwell, 1.

On motion of Mr. Parkill, Mr. Colman's election was made unanimous.

On motion the association then proceeded to an informal ballot for vice-presidents, it being decided that the three persons receiving the highest number of votes should be the first, second and third vice-presidents, in order of the strength of vote.

The following were put in nomination: Mr. Pauly, Prof. Stevens, Mr. Hall, Mr. Jesson, Mr. Vernor.

Mr. Parsons: While the ballot is being taken I would like to suggest that there is one question to come before the association before adjournment that it might be well to consider now, and that is the suggestion of names to the governor, from which he may make a choice of a member to fill the vacancy on the Board of Pharmacy in place of the outgoing member.

Mr. Watson: I move that we proceed to an informal ballot for names to be presented, the five receiving the greatest number of ballots, to be recommended by the association.

Mr. Parsons: Perhaps some persons are not familiar with the way in which this matter was conducted last year. Certain names were selected by this association and were subsequently printed and sent to the members throughout the state, asking them to designate one name, there being twelve names on the circular, the understanding being that the five persons receiving the highest number of votes should have their names sent to the governor.

Mr. Watson: I would like to have the five highest go before the governor. My idea is to proceed the same as last year.

Mr. Parsons: The circular we sent out last year was confined to members of the association. I think I am violating no confidence when I say that some of the votes received were from registered clerks, who were not members of the association. My individual opinion is that every one who has to pay a fee to the Board of Pharmacy ought

to have something to say about the matter. I don't know whether it is practicable to send it to every man or not. A good many of the members think that this association is a representative body of pharmacists of this state, and if outside druggists do not care enough about the society to become members, they ought not to be allowed to vote.

Prof. Stevens: I think it should be limited to the members of the association. I think we ought to have something to be an inducement to druggists to join the association.

Mr. Vernor: It will be impossible for me, as secretary of the Board of Pharmacy, to send out those circulars unless I send them to every registered pharmacist and assistant in the state. Last year there were no votes cast for a person who was not a member of the association. If you send this out at the same time we send out the renewal certificates, it will cost you nothing, and a person who is not a member of the association will see it, and he will say I ought to have a voice in that matter, but I can't unless I am a member. So in that way we may be able to get some members. I don't think there will be any difficulty in checking these slips off. I should favor sending them to every registered pharmacist in the State of Michigan, but we wouldn't count them unless they were members.

Prof. Stevens: I have no objection to that.

President: We will listen to the result of the formal ballot for vice presidents.

The result was announced as follows: Mr. Parkill, 30; Mr. Pauly, 28; Mr. A. S. Parker, 22; Mr. Hall, 21; Mr. Anderson, 10; Prof. Stevens, 2; Mr. Vernor, 2; Messrs. Brown, Bugbee, Jesson, Inglis and Dupont, one each.

Messrs. Parkill, Parker and Hall were declared elected.

President: The next in order is the election of a secretary.

Mr. Parsons and Mr. Bugbee were nominated, when on motion of Mr. Snow the nominations were closed, and the association proceeded to a formal ballot.

On motion of the president, pending the ballot, names were requested for members of the Executive Committee and the following names were suggested: Mr. Wurzburg, Mr. Inglis, Mr. Webb, Mr. Moore, Mr. Stringer.

On motion of Prof. Stevens, the secretary was directed to cast the ballot for the above names as members of the Executive Committee, it was so ordered and they were duly elected.

The tellers announced the result for secretary: Mr. Parsons, 26; Mr. Bugbee, 19, and Mr. Parsons was declared elected.

President: It is now in order to elect a treasurer.

Mr. Vernor nominated Mr. William Dupont. Mr. Snow moved that the nominations be closed, which was carried.

On motion the secretary was directed to cast the ballot of the association for Mr. William Dupont as treasurer.

On motion the order of business was suspended to allow the association to fix the place of meeting.

Mr. Peck invited the association to meet at Grand Rapids, and on motion of Mr. Watson, the invitation was accepted, and Grand Rapids was selected as the place of meeting.

Mr. John D. Muir was elected local secretary.

The tellers announced the following as the result of the balloting for member of the Board of Pharmacy, Goodrich, 16; Parkill, 11; Wurzburg, 6; Bugbee, 3; Watson, Thum, Peck, Caldwell, Snow, Inglis, Parsons, one each.

On motion the association took a recess until the following morning at 9 o'clock.

FIFTH SESSION.

October 22, 1891, 9 A. M.

President: Our president elect was obliged to leave the city and it falls upon our first vice president to preside this morning, Mr. Parkill.

Mr. Parkill then assumed the chair.

Chairman: Mr. Colman has handed me the following communication to be read.

The communication was read by the secretary as follows:

To the Michigan State Pharmaceutical Association:

GENTLEMEN—Permit me to express to you my appreciation of the honor which you have conferred upon me in making me your president, knowing as I do that the honor has not been earned by any past service. I shall endeavor to merit it in some measure by future service. A previous business engagement which I cannot postpone, compels me, much to my regret, to be absent from your last session.

I appoint the Committees as indicated on the following list.

Most respectfully,

H. G. COLMAN.

Chairman: It should be in order to fix the time of the next meeting.

Mr. Vernor: I move that the selection of the date be left to the Executive Committee and the local secretary.

Prof. Prescott: I think it would be better to have a preference expressed by the association.

Mr. Hall: I make the suggestion that the local secretary and Executive Committe give us as early notice as possible of the time of meeting.

Mr. Brown: I think that it ought to go in the proceedings, and I will make that as a motion.

Carried.

[While on the press with these proceedings the Executive Committee reports that the time selected for the next meeting, is August 2, 3, 4, 1892. (Secy.)]

The chair then announced the appointment by the president of the following standing committees.

COMMITTEES 1891-'92.

TRADE INTERESTS.

J. E. Peck, Chairman, Grand Rapids.
F. J. Wurzburg, Grand Rapids. W. A. Hall, Greenville.

PHARMACY AND QUERIES.

A. B. Prescott, Chairman, Ann Arbor.
J. B. Watson, Cooperville. D. E. Prall, Saginaw.

LEGISLATION.

James Vernor, Chairman, Detroit.
H. Kephart, Berrien Springs. D. B. Perry, W. Bay City.

ADULTERATIONS.

H. W. Snow, Chairman, Detroit.
Geo. McDonald, Kalamazoo. O. C. Johnson, Ann Arbor.

MEMBERSHIP.

H. B. Fairchild, Chairman, Grand Rapids.
R. P. Williams, Detroit. Jas. E. Davis, Detroit.
C. C. Hinchman, Detroit. B. L. Lambert, Detroit.

TO SUBMIT CONTRIBUTIONS TO PHARMACOPŒIA REVISION COMMITTEE—(If Needed.)

A. B. Stevens, Ann Arbor.
O. Eberbach, Ann Arbor. Geo. Gundrum, Ionia.

COMMITTEE TO SECURE EXPRESSION OF MEMBERS ON NAMES TO PRESENT TO GOVERNOR FOR MEMBER OF BOARD OF PHARMACY.

Chas. W. Parsons, Detroit.
J. W. Caldwell, Detroit. E. T. Webb, Jackson.

Chairman: The third member of the Committee on Trade Interests and of the Committee on Pharmacy and Queries, are still under consideration by the president, and they will be announced later. (The completed committees are as given.)

Chairman: The next in order is miscellaneous business. What is the pleasure of the association?

Mr. Blakeslee: I understand there is a very interesting paper to be read by Mr. Thompson, and I move you that it now be presented.

Prof. Prescott: There are several papers for this morning and there seems to have been no time before this when they could be presented. Prof. Stevens and Mr. Thompson, have papers, and at 10:30 Dr. Freer will be in from his lecture, and if we should be in session, I would like to have him read his paper.

Chairman: Unless there is objection, we will proceed to the reading and discussion of papers.

Mr. F. A. Thompson then read a paper on the Assay of Pharmaceutical Preparations.

ASSAYING PHARMACEUTICAL PREPARATIONS.

BY F. A. THOMPSON, PH. C.

GENTLEMEN:—The question of assaying and standardizing pharmaceutical preparations, such as fluid and solid extracts, tinctures, etc., has been subjected to no little discussion, *pro* and *con*, during the last decade, and at no time during that period has it ever received more earnest attention than at present, which may be attributed largely to the fact that our

guide book, the U. S. Pharmacopœia, is being thoroughly analyzed and revised; and there can be little doubt that this subject will be thoroughly considered, as indicated by the general principles adopted at the convention held May, 1890, governing the same, and the issue of the Digest of Criticisms. Before adopting processes, it is important and necessary that each one be closely scrutinized and submitted to actual trial, and it is with this end in view that these notes are prepared and submitted at this meeting.

For several months I have been laboring, especially in the field of pharmaceutical assaying, with a view of presenting, if possible, a more practical scheme, which might be applied in a general way to the examination of most of the fluid extracts, tinctures, etc., with slight modifications, as necessary, for each preparation. It affords me much pleasure to say that I am able to submit what I consider as an entirely new method, adapted to wide application. However, after I had satisfied myself with the practicability of the scheme, I received a copy of the proceedings of the 39th meeting of the A. P. A. containing a paper on Query 51—"What proportion of cinchona bark of commerce corresponds to U. S. P. 1880 requirements," by Prof. E. L. Patch, who states that the same Prollius' method applied by him in the assay of cinchona bark can be used in the assay of the respective fluid extract, as follows: "10 c. c. intimately mixed with 10 g. of clean sawdust in wide neck Erlenmeyer flask and the mixture evaporated to dryness, mixed with 100 c. c. of Prollius' liquid and proceed as before."

My method consists also in the use of sawdust, but only *oak sawdust*, for the tannin it contains, which holds back the coloring, waxy and extractive matter, and considerable chlorophyll. I have experimented with pine and whitewood sawdust with entirely unsatisfactory results, the sawdust itself giving up color to the Prollius' solvent, and failing to hold back the coloring matter, etc., from the preparations tried, as well as the oak sawdust. The latter, treated with the same solvent, gave up no coloring or extractive matter, and being more active than ordinary sawdust in absorbing these constituents from various fluid extracts, I trust I may be justified in claiming its use, and applying it to most of the galenical preparations, as an innovation, presenting an entirely new principle in pharmaceutical assaying.

In any process of assay it is important that a majority of alkaloids be not exposed to the action of acids or alkalies longer than necessary, especially at an elevated temperature. By my general process a fluid extract can be assayed in three or four hours, that is, if one chooses to devote his entire attention to the assay, from its inception to its completion, which is impractical to any analyst who is continually occupied with various examinations, and I think would be the same to any druggist or pharmacist, who we will say makes a limited number of assays during the year, and consequently the question of an hour or two is of little importance.

After mixing the respective fluid extract with the sawdust, I place it in a warm oven, heated by steam to about 110° F., from one-half to one hour, which is quite sufficient to remove all the alcohol and moisture from the fluid. This mixture is transferred to a four-ounce elongated bottle, the Prollius' mixture added, and after macerating 15 to 20 minutes with frequent shaking, an aliquot part of the ethereal liquid is decanted, and after rendering it acid, it is evaporated spontaneously or at a temperature of about 110° F. (in a warm oven), and the last traces of alcohol removed by digesting a few minutes on a steam sand bath. The resinous and waxy matter and chlorophyll, of which there is usually a very small amount compared with that extracted with chloroform, are again dissolved in ether and the two fluids transferred to a two-ounce bottle, and after rejecting the ether soluble portion, the alkaloids are extracted with ether and chloroform, after the addition of an alkali.

In reviewing the above summary of the method, it is apparent that the alkaloids are subjected to only a slight heat, insufficient to break up the most sensitive ones, as determined by experimenting with known quantities of crystalline atropine sulphate and hyoscyamine, which are types of the most delicate alkaloids. My experience, so far, has been to obtain alkaloid

much purer than by any of the known processes, and of slightly increased yield in some cases. I don't consider the process as praticable, for the assay of nux vomica, ipecac and guarana. as these given in Lyons' Manual of Pharmaceutical Assaying, though it is barely possible that it could be applied to the assay of ipecac, with a view of obtaining the alkaloid by weight, instead of by titrating with Mayer's reagent, that being the most satisfactory at present. I regret to say that my time has been limited in applying this process to the assay of the entire list of important preparations, my work so far embracing those which heretofore have been most difficult and tedious to examine, such as belladonna leaves and root, stramonium seed and leaves, colchicum root and seed, cinchonas and henbane. Regarding the latter I have not quite satisfied myself as to the accuracy of the results obtained, but have every reason to believe that it will prove satisfactory even with this important and extremely difficult fluid to assay.

It is not my intention to discuss, in this paper, other processes of assay. However, it might not be amiss to offer a few words on a proposed scheme which has caused considerable stir among some members of the pharmaceutical profession, and recently introduced at the A. P. A. meeting by Prof J. U. Lloyd. My experience with this method, as well as that of others associated with me in analytical work, has been extremely unsatisfactory, being unable to obtain all the alkaloid from the amount of fluid extract directed, by the use of 50 C. c. of chloroform (ammoniated or pure); and the manipulations are not practical or easily executed, requiring three glass separators and *several transfers* of the aqueous and chloroform solutions, which admits of a great possibility for loss of alkaloids. The absence of figures to establish the accuracy of the scheme impressed me as being rather queer, inasmuch as the author made such positive claims of superiority over all known methods, and even insinuating in a supplementary report that there was little doubt that the committee for the revision of the Pharmacopœia would adopt the process in substance. Regarding the originality of using the solution of ferric chloride for precipitating the coloring matter in galenical preparations, I can offer no better remarks than those stated by Dr. W. M. Mew, chemist for the United States Medical Service, in a recent interview I had with him on the subject of pharmaceutical assaying. He stated "that in 1874 he had applied a solution of ferric chloride to the assay of some fluid extracts, which was suggested while working upon the drinking waters of Washington, with unsatisfactory results, being unable to extract all the alkaloids present. He did not, at the time, consider the suggestion of sufficient importance for publication."

Inasmuch as I have directed your attention to Lloyd's method, I beg to place before you a list of the necessary apparatus for each, and the cost, which no doubt plays an important part in the consideration of this subject by the inexperienced person, and not a little by the experienced worker. The apparatus necessary for the proposed process is simple, inexpensive, and most of it can be found in every drug store. A common saucer can be satisfactorily substituted for an evaporating dish, thus materially reducing the expense:

LLOYD'S.	
Mortar and pestle, spec.	$0.40
50 c. c. grad. cylinder	.48
25 c. c. " "	.36
5 c. c. " pipette	.12
3 separators	2.40
Tared capsule	.16
Total cost	$3.92

AUTHOR'S.	
Evap. dish	$0.35
4 oz. bottle	.02
100 c. c. grad. cylinder	.54
10 c. c. " pipette	10
4 oz. beaker	.10
2 oz. bottle	.02
Tared capsule	.15
Total cost	$1.45
Difference by using saucer	.30
	$1.15

PROPOSED METHOD FOR THE ASSAY OF PREPARATIONS OF BELLADONNA, STRAMONIUM, CINCHONAS, AND HENBANE,

	Requirement based on average strength of drug.	Amount for Assay.
Fluid Ext. Belladonna Leaves	0.40% total alkaloids.	10 c. c.
" " " Root, U. S. P.	0.50% " "	10 c. c.
" " Stramonium Leaves	0.35% " "	10 c. c.
" " " Seeds, U. S. P.	0.35% " "	10 c. c.
" " Cinchona Calisaya, U. S. P.	2% quinine.	2 c. c.
" " " Red, not less than	4% total alkaloids.	2 c. c.
" " " Pale, " " "	3% " "	2 c. c.
" " " Henbane, U. S. P.	0.10% " "	25 c. c.

REAGENTS:

Oak sawdust, No. 30 powder.....5 to 7 grammes.
Modified and Prollius' mixture*.....100 c. c.
Dilute sulphuric acid. 1 to 5.....q. s.
Chloroform (1 vol.) and ether (4 vol.) mix.....q. s.
Ammonia water.....q. s.

DIRECTIONS.—Gradually add the respective fluid extract (cinchona is best diluted, 1 in 5, with 50 per cent. alcohol) to five or seven grammes of the sawdust, contained in a shallow dish, and after thoroughly mixing, expose in a warm (100° to 110° F.) place for half to one hour. Transfer the dry mixture to an elongated four ounce bottle, and add 100 c. c. modified Prollius' mixture. After macerating 15 to 20 minutes, with frequent shaking, transfer 50 c. c. of the clear supernatant liquid to a suitable beaker, add 5 c. c. of water and q. s. dilute sulphuric acid to render aqueous fluid distinctly acid, after thoroughly mixing with ethereal solution and evaporate spontaneously or at a low temperature, removing the adhering alcohol by digesting a few minutes on a steam sand or water bath. Re-dissolve all the chlorophyll, wax, etc., in ether, and transfer the two fluids to a two ounce prescription bottle, having a good lip, rinsing the beaker with sufficient acid water and ether to remove all the contents to the bottle. Wash the acid solution with ether until free from chlorophyll and coloring matter, rejecting the same, then add q. s. ammonia water to render the fluid distinctly alkaline, and extract the alkaloids with the ether-chloroform mixture, using three portions, of 15, 10 and 10 c. c. each, respectively. The addition of 5 c. c. of ether here facilitates the complete separation of the ethereal fluid. Evaporate the combined ether-chloroform solution to dryness at a low temperature or spontaneously in a tared capsule and dry the alkaloid residue at 175° to 189° F. to a constant weight. The alkaloids so obtained should be completely soluble in dilute sulphuric acid. In case of Cinchona Calisaya the per cent. of quinine can be estimated by the present U. S. P. method, or still better, by Devrij's precipitation, as an iodo-sulphate.

Remarks: The above process may be carried out satisfactorily by one of the following modifications: *First.* Instead of evaporating the ethereal solution it can be placed in a separator, and the alkaloids extracted out with a small quantity of acid water, using 3, 2, 2 and 2 c. c. respectively, and this solution treated the same as the acid solution in the above process. *Secondly.* The alkaloids may be extracted with larger quantities of acid water, using about 20 c. c. in four portions of 5 c. c. each, transferring the same to a separator, adding an alkali, and extracting the alkaloids with chloroform, using three portions of 10 c. c. each, and evaporating the same to dryness, and drying residue to constant weight. By the latter method particles insoluble in acid water are sometimes carried along with the chloroform, unless great care is exercised, and time allowed for the chloroform solution to entirely separate. In practice I prefer the original method.

*Ether.....250 c. c.
Chloroform.....90 c. c.
Alcohol.....25 c. c.
Ammonia, conc.....10 c. c.

PROPOSED METHOD FOR THE ASSAY OF PREPARATIONS OF COLCHICUM SEED AND ROOT.

	Requirement.	Amount for Assay.
Fl. Ext. Colchicum seed, U. S. P.	0.50 colchicine, by trituration.	10 c. c.
" " " root, "	.0.50 " " "	10 c. c.

REAGENTS.

Same as used for above process.

Directions:—Proceed the same as with the above process till the alkaloids are obtained in an acid solution, and instead of extracting, dilute the solution to 15 c. c. with three per cent. sulphuric acid and titrate with N—20 Mayer's reagent.

**Rule for Calculating Results:*—Subtract from c. c. N—20 Mayer's reagent used, for each c. c. of fluid after titration, 0.08 c. c. and multiply the remainder by 0.29 for percentage. If less than 3 c. c. N—20 Mayer's reagent is required, dilute only to 10 c. c.

PROPOSED METHOD FOR THE ASSAY OF PREPARATIONS OF COCA LEAVES.

	Requirement.	Amount for Assay.
Fl. Ext. Coca leaves, U. S. P.	0.50 ether sol. alkaloids.	10 c. c.

REAGENTS.

Oak sawdust, No. 30 powder	5 to 7 grammes.
Benzin	95 c. c.
Alcohol (9 vol.) and Ammonia (1 vol. con.) Mix	5 c. c.
Dilute Sulphuric Acid, 20 per cent	q.s.
Ether	q.s.
Ammonia	q.s.

Directions:—Obtain the dry mixture of sawdust and fluid extract the same as by above process, and after transferring to suitable bottle, add the benzin and ammoniated alcohol, and macerate for an hour with frequent shaking. Decant 50 c. c. of the supernatant liquid to a suitable separator, add about 2 c. c. of water and q. s., dilute sulphuric acid to render aqueous fluid distinctly acid after a thorough rotation of the two fluids. Draw off the acid fluid after complete separation into a two ounce bottle, having a good lip, repeat washing benzin solution with small portions (2 c. c.) of slightly acid water, using not over 10 c. c. in all. Wash the acid fluid with ether till free from chlorophyll and any other coloring matter, render fluid alkaline with ammonia water and extract alkaloid with ether, evaporating the combined ethereal washings in a tared capsule. Dry alkaloidal residue to a constant weight at 175° to 180° F. Alkaloids should be completely soluble in dilute acid water.

PROPOSED METHOD FOR THE ASSAY OF PREPARATIONS OF CONIUM SEED.

	Requirement.	Amount for Assay.
Fl. Ext. Conium Seed	0.50 Coniine	10 c. c.

REAGENTS.

Oak sawdust, No. 30 powder	5 to 7 grammes.
Benzin	q. s.
Alcohol (9 vol.) and ammonia (cone. 1 vol.) mix	5 c. c.
Dilute hydrochloric acid, 1 per cent	q. s.
Hydrochloric acid, U. S. P	q. s.
Potassium carbonate	q. s.

Directions:—Proceed the same as with coca preparations up to the step of extracting the alkaloids from benzin solution, there substituting hydrochloric for sulphuric acid, using the one-per-cent. acid after the first washings. Wash the acid solution with ether, reject, add about 20 c. c. benzin, and sufficient potassium carbonate to precipitate the alkaloids, and shake vigorously. Decant the benzin solution into a two ounce vial containing 5 c. c. of one-per-cent. hydrochloric acid. After complete separation, return

*Lyons' Manual of Assaying, p. 78.

to the original bottle, and repeat the washings two or three times, or until the alkaloid is completely transferred to the acid solution. Transfer this acid solution, which should be clear, otherwise filter, to a tared capsule by the aid of alcohol, and evaporate at a low temperature, hastening the volatilization of the last traces of uncombined hydrochloric acid by adding at intervals one or two c. c. of alcohol. Dry at about 90° C., to a constant weight, and weigh as muriate. Multiply the result by 0.77675 to obtain the amount of coniine.

RECAPITULATION OF RESULTS OBTAINED BY LYONS', LLOYD'S AND AUTHOR'S PROCESS.

Preparation.	Lyons' (Manual of Assaying.)	Lloyd's.*	Author's.
Fl. Ext. Belladonna leaves.	0.44 per cent.	0.40 per cent. (re-extracted.)	0.45 per cent. 0.47 "
Fl. Ext. Belladonna root.	0.44 "	0.39 per cent. (re-extracted.)	0.46 "
Fl. Ext. Stramonium seed.	0.36 "	0.30 per cent. (re extracted.)	0.34 "
Fl. Ext. Stramonium leaves.	0.34 "	0.27 per cent. (re-extracted.)	0.34 "
Fl. Ext. Cinch. Comp.	1.47 " (lime process.)		1.52 "
Fl. Ext. Conium seed.	0.40 "		0.38 "
Fl. Ext. Colchicum root.	0.36 "		0.38 "
Fl. Ext. Coca leaves.	0.53 " 0.50 "		0.51 "
Fl. Ext. Henbane.	0.09 " †		0.092 " 0.088 "
S. Ext. Stramonium leaves.	2.7 "		2.9 "
S. Ext. Belladonna leaves.	4.6 "		4.9 "
Cocaine, (muriate) in 50 per cent. alcohol.	Amount taken. (1) 0.50 Gm. (2) 0.50 " (3) 0.50 "		Found. (1) 0.0485 Gm. (2) 0.0495 " (3) 0.049 "
Atropine, (sulphate) in 50 per cent. alcohol.	Amount taken. (1) 0.0392 Gm. (2) 0.0191 " (3) 0.0191 " (4) 0.0392 "		Found. (1) 0.038 Gm. (2) 0.020 " (3) 0.0185 " (4) 0.038 "
Hyoscyamine, in 50 per cent alcohol.	Amount taken. 0.020 Gm.		Found. 0.0185 Gm.

*Using 75 c. c. instead of 50 c. c. chloroform for 5 c. c. of fluid extract.
†Modification of Beckurt's process. Pharm. Rund., Oct., 1891, page 240.
Parke, Davis & Co.'s Analytical Laboratory, Detroit, September, 1891.

President: Is it material what kind of Oak is used for sawdust, white or black oak?

Mr. Thompson: No.

Prof. Stevens: What was the difficulty in estimating that quantity.

Mr. Thompson: I don't consider it as important. There was no difficulty.

Prof. Stevens: This paper is certainly a very interesting one and is interesting because of the comparison of this and Lloyd's methods. There seems to be little difference in the labor involved, except in the maceration. Lloyd's method was so simple it seemed to take every one by storm, and at the time it was presented, the whole association was carried away with it. Perhaps from the fact that he used nux vomica he illustrated the whole method in a very short time before the association, passing the mass around to the members, who examined it. No one was able to detect a bitter taste from the residue left. In talking with Mr. Snow and others, I have found the same difficulty Mr. Thompson has spoken of, that is, in being able to wash the mass free from the alkaloid, existing in the free state, as it must exist. It is so strongly alkaline that even the mass you take in the mouth is alkaline, there is no chance for the fluid of the mouth to act upon it, and it is so insoluble that that is the reason for the apparent complete exhaustion of the alkaloid. I have done some little work on this subject, but I have not had time I would like to have had. I have performed experiments according to Lloyd's method and Mr. Thompson's. I simply speak of one of them. Taking belladonna, the amount of alkaloid by Thompson's method was .47, with Lloyd's .40, and yet the result was apparently as free from impurities in one as in the other, and the alkaloid was as white in Thompson's method as in Lloyd's. This matter it seems to me is one that will bear careful work, although the figures given us here by Mr. Thompson I think are certainly proved by his work. I will say this, that the method that Mr. Thompson sent to us was not quite as he has given it today. He has modified it since, I think to its benefit. So far, I am quite in favor of the method presented.

Mr. Snow: Have you ever had occasion to use pumice stone as an absorbent? I have often times used it with good results, and I would like to know whether you have used it?

Mr. Thompson: I have tried it in a limited number of assays in connection with this, and I found the alkaloid to be very pure. The solution was not quite as free as with the sawdust, and it required a somewhat longer time. In a way it seemed to have a similar action.

Mr. Snow: I have used pumice stone myself during the last three or four years with very satisfactory results. Inasmuch as Mr. Thompson has referred to Lloyd's method, I want to say that my assistant has performed quite a number of comparative estimations, and he is not at all satisfied with the method as originally announced by Prof. Lloyd. As Mr. Thompson has said, if you evaporate your chloroform solution, you have sometimes to double and treble some of the fluids before you get all the alkaloid washed out. Guarana was the only drug with which he got satisfactory results, and that was the one that seemed to strike everybody at the A. P. A. Ipecac did not do as well, and there were others that did not.

Prof. Prescott: I see you have stated, Mr. Thompson, that the sawdust itself gave up no coloring or extractive matter. Did you find a residue by treating with the sawdust alone?

Mr. Thompson: In carrying it right through, yes.

Prof. Prescott: If evaporated to dryness, would there be a weighable residue?

Mr. Thompson: No. Of course, there is a little tannic acid. There must be a trace of it, but perhaps not weighable.

Mr. Blakeslee: Would not the tannin be likely to attack the alkaloid?

Prof. Prescott: It would, but if there is no weighable quantity of tannic acid we do not need to consider that question.

Mr. Hall: Was there extreme accuracy spoken of in this process of Lloyd's at the time the paper was read? I saw it in the journals at the time and I gathered that it was intended as a sort of approximate assay?

Prof. Stevens: I don't think it was given with any such idea. It was given as an accurate method, and yet as one that was very simple.

Mr. Snow: The idea I gathered from it was that it was the most accurate method that had yet been suggested.

Prof. Stevens: There is a paper here bearing on this same subject that I would like to read if there is no objection.

President: Proceed.

Prof. Stevens: This paper is by Mr. Adams, upon the Recovery of Atropine from Belladona.

THE LIMIT OF RECOVERY OF ATROPINE FROM BELLADONNA.

By Arthur W. Adams, Ph. C.*

Belladonna leaves were used in these experiments. The leaves were first estimated, to find the amount of alkaloid that could be obtained from the leaves. A definite quantity of atropine was then added to the leaves and then assayed, when it was found that the atropine had sustained a loss of 46¾ per cent. On examination it was found that the chloroform used to free the original acidulated solution from fat, chlorophyl, etc., contained a large amount of alkaloid; this was then treated according to Dr. Squibb's method by washing with acidulated solution. The acidulated solution was then rendered alkaline and washed with chloroform. By this means sixty eight per cent. of atropine was recovered. From these results Mr. Adams draws the conclusion that 68 per cent. of the atropine in belladonna leaves may be separated by Dr. Squibb's method and 58 per cent. by Dunstan and Ransom's method, and that doubtless, the same would be true of the root.

President: The further reading of papers is in order.

Prof. Stevens: I have another paper on Cinchona Assays, by Mr. Ashley.

CINCHONA ASSAY OF ALKALOIDS IN COMMERCIAL SAMPLES.

By Wm. F. Ashley, Ph. C.†

The method of assay used was that given in Lyons' Manual of Assaying, but as there is some loss of Prollius fluid by evaporation, it would be better to add Prollius fluid to a definite weight, and after standing the required time, weigh and replace the loss in weight by the addition of more Prollius fluid.

Twenty-five samples were assayed; the results of which may be briefly stated as follows:

Two samples of red bark (whole) assayed 3.56 per cent. and 5.31 per cent., respectively. Twelve samples of red bark (ground) minimum 0.73 per cent, max. 7.38 per cent., average 3.17; one sample of yellow bark (ground) min. 1.73 per cent., max. 5.10 per cent., average 3.31 per cent. One pale bark, assayed, 1.31 per cent. Total average, 3.3⅔. The U. S. P. standard of 3 per cent. is not far below the average of current barks, but barks yielding a much higher per cent. of total alkaloids than the pharmacopœial standard may be obtained by paying for them, as the price was invariably in proportion to the yield of total alkaloids.

Mr. Hall: About what was the average price of those barks this gentlemen experimented on?

Prof. Stevens: The paper does not state the prices, but it says this; that the prices varied in proportion to the alkaloidal quantities of the bark.

Mr. Hall: The reason I asked was, that there are some powdered samples of the bark running as high as seven per cent. in total alkaloid, for a price of about eight cents from seven to eight cents, put up in pound packages.

Prof. Stevens: I think if our Pharmacopœial standard was a little higher we would have no difficulty in getting it.

*Mr. Adams entered the university from Oberlin College at the age of twenty-one. He is at present engaged with Hull & Tilton, pharmacists, Bay City, Mich. The method used was that of Dunstan and Ransom, 1885, Ph. Jour. and Trans. [3] 16—387.

†Mr. Ashley entered the pharmacy department at the age of 20 from the Medina High School, having previously had one and a half years practical experience. He is at present engaged by Mayell-Hopp Drug Co., Cleveland, Ohio.

Mr. Blakeslee: I would like to ask you if that bark containing .73 was obtained from a retail pharmacist?

Prof. Stevens: Yes, I am certain it was.

Mr. Thompson: The barks are running of much higher grade. A cheap bark is a very rare thing for me to see in my business.

Prof. Stevens: In a large house where the dealer would know they were making assays, they would not be apt to present them a cheap bark. It would not be nearly as likely to occur as it would in a smaller house. They are cultivating cinchona to a very large extent in South America, although it is not confined to South America now as it was years ago.

A paper was then read on the Valuation of Mercurial Ointment, by H. Bird.

VALUATION OF MERCURIAL OINTMENT.

By Harry L. Bird, Ph. C.*

The methods used in these estimations were those of Dechan and Mabree's (Ph. Jour. & Trans. Vol. 15, p. 230) and Herold Senior's (Ph. Jour. & Trans., Vol. 15, p. 362). Both methods were tried on samples of known composition, and both were found to give accurate results. Fifteen samples obtained from retail stores were analyzed.

The percentage given is for metallic mercury as follows:

No. 1	45 %	No. 9	45.16%
" 2	47.62%	" 10	48.1 %
" 3	42 18%	" 11	40.6 %
" 4	46.5 %	" 12	34.9 %
" 5	18.18%	" 13	39.46%
" 6	47.22%	" 14	12 %
" 7	43.19%	" 15	43 %
" 8	30.9 %		

Only three of the samples contained traces of oxide. Samples known to be over three years old did not contain a trace of oxides, from which Mr. Bird infers that if oxides are present in mercurial ointments it must be due to the method of manufacture, rather than to the age of the ointment. It will be observed that all of the samples analyzed were below the pharmacopœial standard.

Mr. Bird recommends the following proposed method for the practical estimation of the metallic mercury in mercurial ointment. (Pharmaceutische Rundschau, Vol. 9, page 116, 1891.

"Make a saturated solution of nitrate of soda or sulphate of magnesia and boil the ointment with this solution in a medium sized test tube till the mercury has all settled to the bottom of the tube and the fat has raised to the top. Place a small splinter of wood in the fatty layer and allow to cool; when the fatty layer has hardened, warm the tube slightly with the hand, or over a gas flame until the mass becomes loosened, when it may be removed by means of the splinter. Decant the supernatant liquid and wash the mercury with water. Boil with a little strong hydrohloric acid to form the mercury into a globule, then wash again, dry and weigh.

Six samples of Saccharated Pepsin were examined. The quantity of coagulated albumen dissolved by one grain of saccharated pepsin varied from 63 to 74 grains

Eight samples of Stronger Pepsin were examined. The quantity of albumen dissolved by $\frac{1}{10}$ gr. of stronger pepsin varied from 104 to 195 grains.

*Mr. Bird entered the pharmacy department at the age of 20, from the Ann Arbor High School. Had one year's practical experience with A. L. Walker, of Detroit, with whom he is at present engaged.

A few experiments were made upon INCOMPATIBILITIES, when it was demonstrated that subnitrate of bismuth did not materially retard the action of pepsin, while five per cent. of alcohol or five drops of the tincture of chloride of iron to $\frac{1}{10}$ gr. of stronger pepsin, retarded the action of the pepsin in a marked degree. The work on pancreation was carefully performed, but nothing especially new was brought out.

Chairman: What were those ointments labelled, what per cent.?

Prof. Stevens: 50 per cent. ointment. None of them are up to the required standard. The point he examined specially was whether or not we might have present some oxides of mercury. He says one of three samples contained traces of oxide. I think I may safely say that very few pharmacists ever manufacture their own mercurial ointments, so if this came through the regular trade channels, and all of them are so much below the Pharmacopœial standard, there is a point that might bear investigation somewhat.

Chairman: We are familiar with the fact that there is a brand marked "Third."

Prof. Stevens: These were purchased for pharmacopœial ointments.

Mr. Blakeslee: Could not a muriate be formed there?

Prof. Stevens: The oleate would all be decomposed in his original method.

The next paper is a paper on the manufacture of some of the Common Salts of Manganese. There is nothing specially new, but I will place it before you.

MANGANESE SALTS.

MISS EDITH GREAVES, PH. C.*

The thesis of Miss Greaves contained a detailed account of the method of preparation of the pure salts of manganese. Owing to the deliquescent nature of some of the salts it was found necessary to dry them in a desiccator over sulphuric acid. The following salts were prepared and placed in the museum of applied chemistry. Manganous Chloride, Oxalate, Sulphate, Carbonate, Arsenate, Acetate, Bromide, Potassium permanganate.

Mr. Snow: I call the attention of the association to the fact that in these small French colored barometers, such as are used for showing changes of weather, after it has occurred, by the use of a colored blotter, nearly all contain quantities of cobalt chloride.

Chairman: It is of a little interest to know what causes the change of color.

Mr. Snow: It is hard to say. It is probably owing to the amount of moisture in the atmosphere That is to say, when the salt is perfectly dry it is of one color, and when it is moist it is of another. It is blue when it is dry, and with moisture changes to purple or pink. Really what it indi-

*Miss Greaves entered this university from the Department of Pharmacy, of Cornell University and graduated with the class of '91.

cates is different conditions of humidity that would foretell any change.

Mr. Hall: To have those colors exhibited, it would have to be exposed to the air?

Mr. Snow: Yes.

Chairman: I suppose that is the reason that kind of a barometer never fails because it never changes until it rains.

Mr. Snow: That is the idea—it never makes a mistake.

Prof. Stevens: We have had a number of students working upon preparations of the National Formulary, but I will not read their papers. Two of them worked on elixirs manufactured according to the National Formulary, and they worked on different elixirs.

Abstracts of these papers are as follows:

REPORT OF NATIONAL FORMULARY COMMITTEE.

To the Michigan State Pharmaceutical Association:

Your members of the National Formulary Committee would respectfully report as follows:

Very little work has been done since your last meeting. The chairman of the National Formulary Committee has issued a call for material that may be of service in the revision of the Formulary, as it is desired to have the revision follow the United States Pharmacopœia as closely as possible. I would therefore request the members of this association to assist me in the work by sending to me any information that will be of service to the National Formulary Committee.

During the past year a very large number of the preparations of the National Formulary have been made by advanced students and placed in the museum of applied chemistry of the university, and in nearly all cases the formulas have given entire satisfaction.

Respectfully submitted,

A. B. STEVENS.

DRY PREPARATIONS OF THE NATIONAL FORMULARY.

By J. W. Whitney, Ph. C.

Mr. Whitney entered the Pharmacy Department of this University from the Pharmacy Department of Cornell, at the age of twenty-two. His Thesis work consisted of the manufacture of a complete set of the dry preparations of the National Formulary for the museum of applied chemistry with notes of the method of preparation.

THE ELIXIRS OF THE NATIONAL FORMULARY.

By A. P. Churchill, Ph. C. and R. M. Berry, Ph. C.*

Eight fluid oz. of each of the elixirs were manufactured and placed in the museum of applied chemistry.

At the time of manufacture, no fault could be found with the formulas as given in the National Formulary. At this time, three months after they were manufactured, we find that the elixir of the phosphates of iron, quinine and strychnine has a very heavy deposit. This preparation has given the pharmacists more trouble than any of the elixirs and will doubtless be modified in the next edition of the Formulary.

LIQUORS OF THE FORMULARY.

By H. P. Snow, Ph. C.†

Mr. Snow manufactured a set of liquors of the National Formulary and placed them in the museum of applied chemistry.

No difficulty was found in their preparation according to the formulas given.

*Mr. Churchill entered the university at the age of nineteen, from the Cleveland High School, and is at present engaged in his father's pharmacy. Mr. Berry entered at the age of twenty from Wabash College.

†Mr. Snow entered upon examination from Le Roy, New York, at the age of 20, having had three years practical experience.

SALTS OF THE ALKALOID BERBERINE.

By Joseph C. King, Ph. C.*

The Thesis consisted of a general description of the methods used in the manufacture of the salts of berberine with references to the original articles bearing on the subject, also very complete references to other salts not made by Mr. King.

The following salts were prepared by Mr. King and may be found in the museum of applied chemistry; Berberine Nitrate, Hydrochlorate, Picrate, Citrate, Dichromate, Iodide, Iodate, Bromide, Chlorate, Salicylate, Benzoate, Bitartrate, Sulphate and Silver Thiosulphate.

DIGESTIVE POWER OF PEPSIN AND PANCREATINE.

By J. C. Hearne, Ph. C.†

The thesis is a comparison of the various samples of pure and saccharated pepsin and pancreatin as found on the market. The method used in the valuation of the pepsin was that of the U. S. P. as modified by C. E. Combs, Ph. G. (Am. Drug. Vol. 14, pg. 103, 1885.

AMYL NITRITE.

By G. G. VanSchoonhoven, Ph. C.‡

Mr. VanSchoonhoven manufactured amyl nitrite by six different methods, and then carefully examined them as to their strength and purity.

The following method was found to give the best results.

"Amyl nitrite is prepared by the process similar to those employed for obtaining nitrite of ethyl, amyl alcohol being substituted for spirits of wine. To obtain a product fit for medicinal use, the amyl alcohol should be carefully purified and have a boiling point of 129°-132°C. By passing nitrous acid gas, best prepared by the action of nitric acid on arsenious oxide) into this alcohol, a very pure amyl nitrite is obtained. After washing the product with water and solution of carbonate of sodium, the liquid is rectified, the fraction passing over between 90° and 100°C. being retained. By carefully dephlegmating a very pure product may be obtained, but it must be again washed with sodium carbonate to separate traces of acid, produced by decomposition of the ether during redistillation. (Ph. Jour. and Trans. [3] Vol. IX-899 and X-231.

I was going to say that in nearly every case the formula given in the National formulary was satisfactory. At the time the last Pharmacopœia was being revised they sent out a preliminary report, and in that report they gave a proposed method. The method has always given satisfaction, I think, so far as I have known of its being used.

Mr. Prall: Do you recall that method?

Prof. Stevens: No.

Mr. Hall: Was that in the proposed draft?

Prof. Stevens: Yes.

Mr. Prall: One of our assistants made a preparation from a formula in the Era which was very satisfactory. We have had trouble with the National Formulary formulæ.

Mr. Hall: In this connection I would like to ask the members here if they have experienced much trouble in making aromatic elixir of Yerba Santa? I have modified that

*Mr. King entered this university after having had one year in the pharmacy department of Cornell University. He had previously had two years practical experience.

†Mr. Hearne entered the university at the age of 21, from the Ky. State College.

‡Mr. VanSchoonhoven entered the university at the age of 19, upon examination, having previously had five years practical experience in pharmacy at Salt Lake City.

somewhat and instead of having syrup in the first, I just left the syrup out so that I had no saccharine solution at all, and I had a product that disguised the taste of quinine equally as well as the other, and it was much quicker done.

Mr. Prall: It is unsatisfactory to dispense the syrup, so much remaining on the bottle.

Mr. Hall: This remains perfectly clear.

Another paper, upon the Estimation of the Fluid Extract of Nux Vomica, was read.

ALKALOIDAL VALUATION OF FLUID EXTRACTS AND TINCTURES OF NUX VOMICA.

By Frank J. Peck, Ph. C.*

The samples were obtained from retail stores in Ohio and Michigan. The estimations were made by Dunstan and Short's method. Ph. Jour. and Trans. Vol. XIV, pg. 292. The results show a decided variation in the strength of both fluid extracts and tinctures, from which we take the two extremes, tincture, 0.146 per cent. to 0.418 per cent. fluid extracts, 1.06 per cent. to 1.90 per cent.

Mr. Thompson: How did the gentleman conduct his volumetric process?

Prof. Stevens: He does not give the equivalents at all. Neither does he give the exact method, except he uses the volumetric method; used Mayer's reagent.

Mr. Hall: Would it not be well to obtain from this investigator the equivalents and the other data before it goes into the report?

Prof. Stevens: Yes.

In completion of the report of the committee on pharmacy and queries the following papers were presented.

ADULTERATIONS.

Powdered Capsicum is well enough known to be adulterated almost without question, but there are questions upon this article, with what is it adulterated, how heavily, and what are the best means of its examination, and these are sought to be answered by the paper of Mr. Burgess†. A careful study of the anatomy of the pods and seeds of Capsicum fastigiatum and of Capsicum annuum is given, with plates from the microscope. Plates of the starches liable to be used as adulterations, are also given. Twelve samples from the market were examined, and only one was found free from adulteration. No other adulterant than a starch was found. Corn starch had been most used; in one sample there was a little rice starch, and in one a large amount of oat starch. In most of the samples the adulterant was about two-thirds of the article; in one the proportion of adulterant was much larger. In 1876 the Committee on Adulterations in the American Pharmaceutical Association received reports on capsicum, with other articles, from the microscopical laboratory of this university, then under charge of Prof. Mark W. Harrington (Proc. Am. Phar. Assoc., 24, 403.)

Spanish Saffron is perhaps a representative instance of established adulteration, in many different ways, and the subject has been worked

*Mr. Peck entered the university on college standing at the age of 23, from Warren, Ohio, and is at this time pursuing special studies in the university.

†The Study of Capsicum and its Adulterations. By Homer Burgess, Ph. C. The author entered this school from Cambridge, Ohio, at the age of 20 years, and after two years of service in pharmacy. He received the degree of Pharmaceutical Chemist in June, 1891.

through quite well by Mr. Corbin, with faithful analyses of eight samples furnished as best grade article*. The methods of examination are well presented. The results obtained may be summarized as follows:

No.	Sensible Properties.	Botanical Examination.	Mineral Constituents.
1.	Moist. Of good odor and color.	A few stamens of Crocus, no other extraneous forms.	Ash, 5.5 per cent.
2.	Dry. Of light color.	The same as No. 1.	Ash, 4.8 per cent.
3.	Moist. Of good color.	A large proportion of crocus stamens.	Ash, 5.5 per cent.
4.	Of good color. Oily. Loaded with fixed oil.		Ash, 5.3 per cent.
5.	Good color and odor.	Many crocus stamens. Also florets of Marigold, twisted and dyed.	
6.	Faded. Of bad odor. Dry and broken.	Half crocus stamens.	Ash, 12.5 per cent. Contains barium.
7.	Dry. Faded. Of good odor.	Some crocus stamens.	Nitrate. Contains sand.
8.	Good.	Very few crocus stamens.	Not in excess.

OATMEAL is a food in very common use. Formerly it was classed as an invalids' food, and it was pharmacopœial. But as a food it was taken as a subject by Mr. Davis†. The chemistry of foods is with good reason in the province of the pharmacist, the chemist of the community. However, the author refers with emphasis to the claims of the alkaloidal body of the oat, as of excitant effect upon the motor nervous system, and to the evidences of the diuretic action of a decoction of the grain. The contribution consists mainly in an elaborate comparison of the anatomy of the oat in comparison with barley, as grains. Fourteen plates are given in setting forth this comparison. The two grains resemble each other, when ground, but with sufficient microscopical distinctions throughout, these being most decided in the starches. In conclusion the results of examintion of ten samples of oatmeal, taken, here and there, from the provision stores of Ann Arbor, are given as follows:

No.
1. Pure oatmeal.
2. Pure oatmeal.
3. Contains husks of the oat.
4. Rice found in it, very likely of accidental source.
5. Contains much barley meal.
6. Contains much barley meal.
7. Not adulterated.
8. Contains barley meal, also oat husks.
9. Contains a little barley meal.
10. Not adulterated.

*Examination of Spanish Saffron, *crocus sativus*, for adulteration. By John W Corbin, Ph. C. Mr. Corbin, a resident of Little Rock, Arkansas, entered the school two years ago, at the age of twenty-two. He has returned to the university for further studies.

†Oatmeal and its Adulterations. The author, Mr. Frank F. Davis, entered the School of Pharmacy in 1889, from City High School in Washington, D. C., at the age of 19, having then been three years in pharmaceutical service. Since his graduation, last June, he has set up a pharmacy of his own in Washington, D. C.

ANOTHER FOOD, or adjunct of food, namely COFFEE, was taken by Mr. Shepherd as a subject for literary research and experimental work*.

He gives first a general discussion of the subject, then a classified list of adulterants of coffee, 79 in number, and outlines of directions for examination, physical, microscopical and chemical. Then follows a chemical and a microscopical exposition of Chicory, then the same descriptions of the Dandelion. Other adulterants are treated systematically under the heads of Cereals, Leguminous Seeds, Other Seeds, Other Vegetable Products, Coloring substances, and Miscellaneous matters. After reporting the analysis of ten samples, a select bibliography is given, comprising eight books and twenty-one articles. The ten samples were purchased of retail dealers in Ann Arbor.

No.	Designation.		Price.	Constitutents.
1.	Mocha & Java.	Unground.	40 cts.	Coffee.
2.	Rio.	Unground.	30 cts.	Coffee.
3.	Rio.	Ground.	25 cts.	Coffee.
4.	Rio & Java.	Ground.	28 cts.	Coffee.
5.	Mocha & Java,	Ground.	30 cts.	Coffee.
6.	Java.	Ground, in packages.	25 cts.	Chicory, roasted corn, peas and wheat.
7.	Rio, Java, Mocha.	Ground.	25 cts.	Coffee, chicory and peas.
8.	Crushed Java.	Ground.	25 cts.	Coffee, chicory, peas, and wheat
9.	Crushed Java.	Ground.	25 cts.	Coffee, chicory, and peas.
10.	Rio.	Ground.	25 cts.	Coffee.

CHEMICAL QUESTIONS.

ESTIMATION OF NITROGEN BY THE MOIST METHOD, proposed eight years ago, is now well established, and Mr. Ando reports a full account of the process†, not claiming any improvement upon it. Last year some experimental notes on this process were contributed from this university, with an Index to Literature upon Estimations of Nitrogen generally (L. F. Kebler, 1891: *Jour. Anal. Chem.*, *5*, 257—With Reprints.)

A STUDY OF ANTIFERMENTS has been made by MR. PERRY BRIGGS. ‡With a discussion of the use of chemical antiseptics and pasteurization, is given an account of a trial of filtration and sealing for preservation of fruit juices. The treatment was found effective in great degree, but not in itself sufficient.

MR. HUESTED presents a BIBLIOGRAPHY as his contribution§. The subject presents a distinct group of organic derivatives, in pure chemistry,

*Methods for Determining the Adulterations of Coffee. By Frank L. Shepherd, Ph. C. Mr. Shepherd entered at 20 years of age, from Kyler, Ohio, and after two years study received his degree, in June, 1891. He has engaged as assistant chemist in the manufactory of Wm. S. Merrell & Co., Cincinnati.

†Estimation of Nitrogen in Fertilizers by Kjeldahl's Method. By Shinichi Ando, Ph. C. Mr. Ando prepared in Oahu College, Sandwich Islands, and entered this School in October, 1889, at the age of 21. Upon his graduation, last June 25, he engaged in manufacturing with Parke, Davis & Co., Detroit, where he now is.

‡Mr. Briggs entered the university from Eureka, Ill., Oct. 1, 1889, at the age of 24 years. He received the degree of Pharmaceutical Chemist, June 25, 1891.

§An Index to the Literature of the Hydroxybenzoic Acids. By F. P. Huested, Ph. C. The author entered the school two years ago, from Albany, N. Y., at the age of twenty-one years, having had three years service with his father, Dr. Huested of the New York Board of Pharmacy. He is now engaged as Instructor in Pharmacy in the Albany College of Pharmacy.

with all that is known of the uses of these bodies as constituents of the salicylic acid of the market, and with the analytical work concerned. The index comprises the citation of about two hundred articles, in alphabetical order of author's name, with references, usually to more than one publication of each article, and with extended descriptive titles. Permanently bound, with a 8½ by 8 inch page for each article indexed, it is a good contribution to the library.

THE INTERACTION BETWEEN CHLORINE AND A BROMIDE, AND BROMINE AND A CHLORIDE has been studied by MR. MCGEE*. The author tried three published methods for determination of a chloride in presence of a bromide, with several modifications of one of these, and the results are carefully and impartially set forth. This contribution is another in the line of that published from this school two years ago. (Estimation of Bromine in Presence of Chlorine, by A. B. Prescott and W. L. Dunn, *Jour. Anal. Chem. 3*, 373.)

Prof. Stevens then read a paper of his own on Saturation Tables of the Pharmacopœia.†

Mr. Parsons: I have been interested in this because I spent six months of my spare time collecting those tables for the Pharmacopœia ten years ago. When you bear in mind that your first step is to express the chemical equation, and base later calculations upon it you will see the work involved. In many of the pharmacopœial salts the formulas finally decided upon by the Committee of Revision were not the formulas accepted as standard at the time the calculations were made, and errors as to percentages, &c., crept in. Whereas the table expressed 96 per cent., when the Pharmacopœia came out it was given as 98 per cent. These are tables that I have found in the manufacture of preparations to be very valuable. I trust that Prof. Stevens will get out a table that you cannot pick a flaw in.

Prof. Prescott: In the earlier years of the work of this association, Dr. Lyons entered pretty largely into a criticism of those tables of the Pharmacopœia which concern specific gravity and per cent., and there seems no reason why this association should not continue that work of reporting upon the errors of the pharmacopœial tables. It seems to be our lot, or our fortune, to be critics of the Pharmacopœia and especially of the pharmacopœial tables. I am glad Prof. Stevens is working on them.

Mr. Vernor: I wish to call attention to the fact that at yesterday's session we neglected to extend a vote of thanks to Dr. Abel for his very interesting lecture. I therefore move that a vote of thanks be given to him.

Carried unanimously.

Mr. Parsons: If miscellaneous business is in order, the usual custom is to pass a complimentary vote of thanks to

*Determination of a chloride in presence of a bromide. By T. H. McGee, Ph. C. Entering from Farmington, Mich., two years ago, at the age of 21 years, Mr. McGee graduated June 25, 1891. He had four years service in pharmacy before his college course.

†See appendix.

our entertainers. I would therefore move that a vote of thanks be extended to those who have so kindly entertained us here and especially to the ladies, who have been to a good deal of trouble for us at our meeting here.

Carried unanimously.

On motion of Mr. Vernor, a vote of thanks was tendered to the officers of the association for their services the past year.

Carried.

Mr. Vernor: I move as a slight token of appreciation of the services of the local secretary, that the treasurer be instructed to draw a check to his order for the usual amount.

Carried.

Chairman: In the absence of any other business, I take pleasure in presenting the association the secretary elect for the coming year, Mr. Parsons.

Mr. Parsons: The expression of your appeciation is indeed thankfully received. Those whose fortune it has been to attend a variety theatre will recall that one of the most active of the song and dance fiends usually makes an expression to this effect, "I will now endeavor to give you an imitation, etc." I trust, ladies and gentlemen, that my attempt to give you an imitation of the work of the secretary will be performed in a manner satisfactory to you. I thank you very heartily.

Chairman: There is one gentleman whom we have elected to an office in the association that we would all like to hear from, the new treasurer, Mr. Dupont.

Mr. Dupont. This is an old chestnut. However, I thank you for your compliment, and I hope at the next tenth annual meeting you will select a new man.

Prof. Prescott: I know of no one man who has done as much for this association as Dr. A. B. Lyons. I think it would be a very appropriate thing for this asssciation to send a greeting to Dr. Lyons through the secretary.

Prof. Stevens: I will make a motion to that effect.

Mr. Parsons: I heartily concur in the motion. Dr. Lyons is on the other side of the world almost, and it will be impossible for him to maintain any active connection with this association, and I would like, if it is agreeable to the members and the propounder of the motion to amend by making him an honorary member of this association.

This amended motion was unanimously carried.

On motion the association adjourned.

THE ENTERTAINMENTS.

The local secretary, Mr. H. J. Brown, assisted by resident members, prepared a very pleasant amusement and entertainment program. On Tuesday evening, October 20th in room 24 of the main university building a large and appreciative audience listened to a short talk by Dr. Victor C. Vaughan upon "The Relations Between Pharmacy and Medicine." (This paper is given in full in the appendix.) Preceding the lecture Miss Minnie Davis gave a piano solo, and was followed by Prof. Thos. C. Trueblood, professor of elocution, in some selected readings. The entire entertainment was very enjoyable.

The following evening at 8 o'clock a reception was held by the faculty of the school of pharmacy and of other departments of the university with the pharmacists of Ann Arbor, at the Chemical building. The ladies, wives of the members or druggists of the town, had very tastily decorated the lecture and recitation rooms and had provided a light repast in the museum. Good music was provided and all seemed to think the reception a unique one, and, therefore, even more than usually enjoyable.

Friday afternoon a carriage ride was enjoyed by a limited number, as many of those in attendance had already departed for their homes. Throughout the stay in Ann Arbor members were given every facility for examining the working of the university, and an especially arranged visit was made in a body on Wednesday afternoon.

The business meetings of the association were held in Room A of the chemical laboratory, where everything was done to facilitate the transaction of business, some of the lectures to the pharmacy students being postponed in order to accommodate the meeting of the M. S. P. A.

In Memoriam.

HUBERT CARRIER, - -	Bay City.
M. CHAMBERLAIN, -	Horton.
D. M. COOPER, - -	Detroit.
S. H. DIMICK, - -	Ypsilanti.
JACOB S. FARRAND, Sr.,	Detroit.
HENRY HAWKINS, - -	Detroit.
WM. T. HENES, - -	Bay City.
W. H. KEELER, - -	Saginaw.
E. A. STEIGER, - -	Detroit.
PAUL TORONTALY, -	East Tawas.
A. TULLGREN, -	Iron Mountain.

APPENDIX.

THE METHODS OF PHARMACOLOGY; WITH EXPERIMENTAL ILLUSTRATIONS.

BY JOHN J. ABEL.

It has been suggested that it may interest you to hear something of the methods employed in modern pharmacological work. Many of you will observe that in the last fifteen or twenty years a new word, apparently, has appeared in medical literature; but in reality it is only an old word that has come back to serve as the name of a new science. Pharmacology, the word I refer to, has its meaning written on its face, being derived from two Greek words, meaning *medicine* and *a discourse*. This word was doubtless used more or less by medical writers from the time of the Greeks, and we find the word in what is called the first complete English dictionary, that of Nathan Bailey, in 1736, defined as "A treatise concerning drugs."

Samuel Johnson, in his famous dictionary in 1755, has it down as equivalent to pharmacy or pharmaceutics, and the acceptance of this definition by medical writers must be the reason it is not found in one of the best medical dictionaries in use early in the century, namely, Hooper's *Lexicon Medicum*, although Walker's pronouncing dictionary in use at the same time gives it the broad definition, "A knowledge of drugs and medicine."

That this word had dropped out of common use is also proved by titles of treatises on the action and uses of drugs down to almost the present day. In these titles, such as *A Treatise on Materia Medica and Therapeutics*, or *On the Action of Medicines*, this word does not appear, and although these works were intended to contain all that was certainly known on the *physiological action of medicines* they did not sift out this part of their work from the applied science of therapeutics, or give it a special name. But among the Germans this word has been much used since the appearance, in the early fifties, of a scientific treatise on drugs by Rudolph Buchheim,* who is claimed by his pupils, now so prominent in Germany, to have been the founder of pharmacology as a pure science.

From this source the word and the ideas it represents have found their way into English medicine, and today you meet with the word in the announcements of medical schools, in journals and in medical works of various kinds. Thus the supplement of the *British Medical Journal* and the *Index Medicus* both have the standing heading, Pharmacology and Therapeutics, in their columns.

Now what does this revival of an old word mean? One of the most eminent, if not the most eminent investigator in this field, Prof. Schmiedeberg, of Strassburg, has defined pharmacology as "The study of the changes brought about in living organisms by chemically acting substances (with the exception of foods) without reference to whether these substances can be used for therapeutic purposes or not.† "It is to be noted that these changes induced in the body are not merely such as can be expressed in the terms of an equation, but also those varied molecular processes that lie in that ever widening borderland between physics and chemistry, and which hold the secret of vital activity.

Briefly, this science tries to discover all the chemical and physical changes that go on in a living thing that has absorbed a substance capable of producing such changes, and it also attempts to discover the fate of the substance incorporated. It is not therefore an applied science, like therapeutics, but is one of the biological sciences, using that word in its widest

*R. Buchheim, Lehrbuch d. Arzneimittellehre I Lieferung 1853, II Lieferung 1856, Voss, Leipzig. A third edition appeared in 1878, and since then the work has been remodelled and is now known as Erich Harnack's Lehrbuch der Arzneimittellehre u. Arzneiverordnungslehre.

†Schmiedeberg. Grundriss d. Arzneimettellehre II Aufl. s. 1.

sense. Like its sister sciences, physiology, physiological chemistry and pathology, it is making great progress along certain physical and chemical lines, which, while but a rough breaking of the ground toward an explanation of vital processes, is pioneer work of a necessary kind.

Time does not allow of our going into the very interesting history of the growth and progress of this science. Its growth is intimately connected with that of physiology. The experiments of Magendie, of Johannes Miller and later of Liedeman, Gmelin, Bernard and many others, though undertaken to elucidate physiological problems, really laid the foundation of pharmacology. Even as long ago as 1813 Magendie had found that the blood has the power of taking up and carrying metallic poisons, and by the middle of the century the doctrine of the action of poisons by sympathy had received its death blow. About the middle of the century, too, the now classic experiments of Claude Bernard [1] and Köllicker [2] proving that the paralyzing action of curari centers in the end plates of the motor nerves, called attention to the value of toxic substances in physiological analysis, and they were followed by a succession of brilliant discoveries, such as those of Schmiedeberg [3] and his pupils with heart poisons like muscarin, Von Bezold [4] with atropine, Luchsinger [5] with pilocarpine, and many others.

It was such experiments as these that led Buchheim and others to insist on the insufficiency of the mere bedside study of medicines, and led to the erection of special pharmacological laboratories [6] in which experimenters can build up their science, undisturbed by the intrusive demands of practical utility. But pharmacology once on a firm basis will yield valuable results for the practical man. Prof. Martin has well said, "To raise therapeutics from empiricism or guess work it is essential to know precisely the action of each drug on each organ in the body, and then its action upon them when working together in the living man."[7]

Let us now illustrate one of the methods employed in studying the action of drugs on individual organs, and let us take the circulatory apparatus, which although composed of a number of organs, such as the heart, arteries, capillaries, veins and the nervous structure controlling their action, may yet serve to illustrate our purpose.

A DEMONSTRATION OF THE ACTION OF CHLOROFORM, ALCOHOL, AMMONIA AND STRYCHNINE ON THE VASCULAR MECHANISM OF THE RABBIT.

The animal before you is to all appearances paralyzed. If I raise one of its limbs and let it fall again I meet with no resistance; if the assistant ceases to inflate the chest with the bellows no inspiratory movements occur. If, however, you place your hand on its thorax or your finger on one of its arteries, you will find that the heart is beating powerfully and that the blood vessels are well filled. This paralysis has a peripheral and not a central cause, for it is due to an injection of the South American Arrow-poison *Curari*, which so affects the protoplasmic masses known as the motor end plates as to make them incapable of transmitting an impulse from the spinal cord or brain to the muscle cells with which they are connected. Thus, although the animal should will to move, it cannot.

A good specimen of *Curari*, given in the quantity [8] just sufficient to

1. Lecons sur les effets des substances toxique et medicamenteuses, pp. 238-354.
2. Virchow's Archiv., Bd. X.
3. Schmiedeberg u. Koppe. Das Muskarin, das giftige Alkaloid des Fliegenpilzes, Leipzig 1869. Williams, Archiv. u. exp. Pathol u. Pharmakol. Bd. XIII.
4. Untersuch, aus dem Physiolog. Laborat. zu Wurzburg. Vol. I, pp. 1-72.
5. Pùger's Archiv. Bd. XIV pp. 369-394. Bd. XV pp. 482-492.
6. Buchheim's Pharmakological Laboratory at the University of Dorpat was the first of the kind in the world and was long the best equipped in Germany. See Archiv der Pharmacie III Reihe. Bd. XVI. pp. 161-169, and Berl. Klin. Wochenschr. Bd. XVII, 1880, pp. 477-479.
7. Studies, Biol. Lab. Johns Hopkins University. Vol. II, No. 4, p. 480.
8. 85 mg. for a large rabbit.

produce this peripheral paralysis, has no appreciable effect on this complicated vascular mechanism whose reaction to drugs we are now studying, but it is an invaluable aid to this very study in that it eliminates the disturbing influences of muscular movements. But there is one set of muscles, those necessary to respiration, whose functions we must perform for them if we are to keep the animal alive and go on with our experiment. It has therefore been necessary to tracheotomize the animal and connect its trachea with a pair of bellows worked by the assistant. This whole procedure is of a very simple nature; the two bottles that you see here half filled with mercury are the so called mercury valves, the one directing a current of air towards the lungs and the other controlling its escape. In the laboratories this is all done by an automatic electrical apparatus, without any care on the part of the operator.

Our next step is to place a glass canula into the carotid artery and connect it with this tube, 2½ meters in length, and with a bore 3 mm. in diameter. If I were now to remove the ligature that has been placed on the artery close to the canula, but between it and the heart, you would see the arterial blood rise in the tube to the height of four or five feet. You have now the original experiment which science owes to the English rector, Dr. Stephen Hales. He in 1708 [1] introduced such a tube into the crural artery of a mare, and observed that the blood rose to the height of more than eight feet.

The chief drawback to this method is the rapid clotting of the blood in the narrow tube. To prevent this some wash the tube out with watchmakers' oil, leaving a little oil in the canula to be pushed up ahead of the blood. My own method is to make use of the well-known anti-clotting properties of a saturated sodium carbonate solution. Just beyond the arterial canula a T tube connection is made with the flask containing the solution. By drawing this flask up toward the ceiling the fluid rises in the tall tube; I now lower the flask and the fluid falls back into the bottle, leaving a little in the canula and the tube adjoining. I now remove the ligature and the blood rises, carrying this small quantity of the solution on ahead with it. This method, while not accurate enough for some scientific work, is still exceedingly useful in class demonstrations, for the blood can be kept in motion in this tube in order to show various conditions of blood pressure for more than three hours at a time without clotting.

As you observe, the blood rises to a height of nearly five feet in this tube and oscillates back and forth with each beat of the heart. This column is a measure of the mean lateral pressure of the aorta at the point where the carotid leaves it, and such an experiment as this is generally spoken of as a blood-pressure experiment.

The height to which this column rises is the resultant of several factors, and it is the most important means at our disposal for studying the condition of the circulatory apparatus in the intact animal. Notice how rapidly the column sinks when the animal is allowed to inhale a few drops of chloroform, and this in spite of the fact that the vapor is largely diluted, for I place, as you see, only a few drops at a time in this large flask connected with the bellows. I add a few drops more and the column falls another foot. It has not yet, however, fallen to what we may call the dead line, for, if you observe, the oscillations corresponding to the heart beats are still present, although more rapid as well as greater in extent.

What is the explanation of this sudden fall of pressure? It is not due so much to a sudden weakening of the heart, for if you place your hand on the thorax you can very distinctly feel it beat, and a glance at the pulsating column gives added proof. Its cause is mainly a lessening of the peripheral resistance due to a sudden dilatation of many small arteries. At first this dilatation was confined to the arteries of the skin, and perhaps the brain, but now those of the abdominal area also are included. What is the cause

1. This date is taken at second hand, as I have not been able to consult the original essays which appeared in 1733 under the title of "Haemostaticks, or an Account of Hydraulick and Hydrostatick Experiments Made on the Blood and Blood Vessels of Animals."

of this dilatation? It is due principally to a paralysis, by the chloroform, of the general vaso-motor center, situated in the medulla oblongata, and which in its normal state exercises a tonic constricting influence on the now dilated arteries. An instance of its normal action was seen early in the course of the experiment before chloroform had been given, when, if you will remember, the blood suddenly rose nearly two feet above the mean level in the tube. This was caused by an accidental irritation of the wound while clamping some of the tubes. The nervous impulses transmitted from the irritated wound to this medullary center so influenced it that the arteries of the splanchnic region were more than normally constricted. Peripheral resistance being thus increased, and the heart beating no less powerfully than before, the mean aortic pressure was necessarily increased. You see, therefore, that this vascular apparatus is a complete mechanism, comprising the heart, arteries, veins, and capillaries, with their inherent nerve and muscle elements, and the extraneous regulating nervous structures, and all these have a greater or less part in producing the alterations of mean blood pressure that we are now observing. To analyze this experiment into its details, and to assign to each of the parts its due share in the production of this resultant—the mean blood pressure—requires refined methods, and has occupied the attention of some of the best experimentalists of the century.

The column of blood now stands low, but still above the dead line: I now pour a few drops of ammonia into the same flask that I have already used for chloroform; see how promptly the column responds. It begins to rise, at first slowly then rapidly, and it will soon have reached its original level. This drug, then, as I have given it, has an effect upon the vascular apparatus contrary to chloroform. I shall not discuss here how far this effect is due to the effect of the ammonia on the mucous membranes of the air passsages and how far to its effect on the various members of the vascular mechanism after absorption. A very similar effect is produced by an intra venous injection of strychnine.

Let us again substitute chloroform for the ammonia and again you will see the column fall, and this time we will approach the dead line more rapidly than before. We have now reached a level of only 6 or 7 inches, a point in itself dangerous to the animal because too low for a proper blood supply to the more important organs. In this case we have, besides, surcharged the sluggishly moving blood with the poison chloroform.

Can we again revive the circulation, now depressed to its lowest limit, by the methods previously used or by the employment of others? Some of you will suggest alcohol. I have here a solution of absolute alcohol, a little weaker than whisky. Let us bring it to the body temperature and watch the effect of a rectal injection. By watching carefully we see a very insignificant rise of an inch or two, due to the local influence of the alcohol. But perhaps the whisky is not absorbed because of the sluggish circulation. Let us therefore inject into the jugular vein a few cubic centre-metres, properly diluted. The column sinks still lower. At such a crisis alcohol acts precisely as more chloroform would. All of it that is absorbed simply adds its depressant influence upon the general vasomotor centre and the heart to that of the chloroform. It is a worse than useless agent in all cases of anæsthesia accidents where the circulation is depressed to a dangerous extent.[1]

The pharmacologist is forced to put chloroform and alcohol into the same group of nerve and muscle poisons,[2] though the former is the more energetic agent of the two.

In order to make reliable measurements of this mean blood pressure, we ordinarily connect the arterial canula with one limb of the mercury

1. See Wood's address on Anæsthesia, Verhand. d. X Internat. Med. Congr. Bd. I. s. 149, where he concludes from his experiments that "alcohol when given in small amounts has no influence, but when given largely, it materially assists in paralyzing the heart," and s. 152, "some at least, perhaps many of the deaths which have been set down as due to chloroform and ether have been produced by the alcohol, which has been given for the relief of the patient."

2. Schmiedeberg's Grundriss d. Arznermittellehre II Edit. pp. 16-21.

manometer, or with a Fick's spring manometer, which records their movements on revolving surfaces.

We have alluded to the fact that refined methods are necessary for the further analysis of the experiment we have been watching.

Thus, to isolate the heart of a cold-blooded animal such as the frog or terrapin, and to pass through it blood to which drugs have been added, and thus to produce alterations in rate and quality of beat, is easy now that Ludwig and his pupils, and later, Schmiedeberg and his followers, have shown us the way. The interpretation of our results is not as easy, even when it seems that we have reduced the problem to its lowest terms. A very important advance in this field was the successful isolation of the mammalian heart, by Prof. Martin,[1] of the Johns Hopkins University, where important researches on the influence of temperature, alcohol, etc.,[2] on the dog's heart have been made, researches that approximate more nearly to conditions obtaining in the human being than any previously made.

But the arteries must also be studied. We must determine whether constriction or dilatation are due to a central nervous influence, or to a local action of the drug upon their walls. In the study of this problem also great ingenuity has been brought to bear; you have only to look at this photograph of Jacoby's apparatus[3] to be convinced of this.

THE INFLUENCE OF THEOBROMIN ON RENAL SECRETION.

The rabbit now on the table has been profoundly anæsthetized by chloral. A manometer connected with his carotid would show a very low blood pressure, and a paralysis of the general vaso motor center so profound that not even asphyxia would cause a rise of blood pressure. The insensibility of the vaso motor center to stimulation produced in it by chloral is very remarkable.

You observe these two slender tubes penetrating the abdominal wall. Their concealed ends have been inserted into the ureters, and the urine, instead of passing into the bladder, must flow through these tubes. The tubes are partly filled with the straw-colored urine, which only at long intervals shoots suddenly forward a space in the tubes; the secretion is evidently at a standstill. Let us now inject into the jugular vein a properly diluted solution, of theobromine-sodio-salicylate[4] and in the course of half an hour we shall see a marked increase in the rate of secretion. The view[5] held at present is that this increase in secretion is due to the direct stimulating influence of the drug on the kidney epithelium, rousing it to increased activity. No doubt some local, vascular dilatation occurs, but the low blood pressure that we have here has not been altered, and we cannot therefore account for this markedly increased secretion of urine on the ground of an improved circulation alone.

By means of proper apparatus and methods we could demonstrate the effect of drugs on the brain and spinal cord, on the respiratory system, on the voluntary muscles, on the movements of the iris, the intestines and of the uterus; on the manner in which glandular secretion is affected, as that of the salivary or sweat glands or the liver. And according to a recent method of Alexander Smidt[6] we can even test the chemical powers of the liver cell entirely separated from its usual surroundings.

This last experiment is in itself an illustration of the chemical side of

1. A new method of Studying the Mammalian Heart. Studies fr. Biolog. Lab. Johns Hopk. Univ., Vol. I, p. 119.

2. The Direct Influence of Gradual Variations of Temperature, Etc., Philosoph. Trans. of the Royal Soc. Part I, 1883, p. 661.

3. Archiv fur exper. Path. u. Pharmacol Vol. XXIII, p. 388-400.

4. Known by its trade name as Diuretin.

5. We owe this new therapeutic agent to von Schroder's acumen, see Schmiedberg's Archiv. f. exp. Path. u. Pharm., Vol. XXII. p. 39, Vol. XXIV, p. 85, Gram. Therap. Monatshefte, Jan., 1890; Babcock, New York Med. Journ., July 11, 1891.

6. Emil Anthen, Ueber die Wirkung d. Leberzelle auf das Haemoglobin, Diss. Dorpat 1889.

pharmacology, and indeed, all of the previous experiments have a chemical side if one will only look for it. Thus, while we were making the experiment with chloroform, many of you may have asked yourselves what changes does the chloroform induce in the blood itself? With what constituents of the blood does it combine?

[1]Pohl working with a modified method of Schmiedeberg last year discovered that chloroform is almost entirely bound to the red corpuscles, and that it is not their hæmoglobin but their cholesterine, lecithine and cerebrine that enable them to hold the chloroform.

Every chemical process known to the modern chemical school, and many that they are utterly impossible to imitate, occur in the animal organism. The simplest cell still defies all the well-trained chemists of an aniline dye factory, as well as the patient researchers of a university laboratory. The humble rabbit, if fed with euxanthon, can produce the famous *jaune indien* or Indian yellow [2] a substance that still defies the synthetic skill of chemists.[3]

And what chemist can break up the Benzol ring, at a temperature of 37½°, in a weak alkaline solution containing various proteids, and easily modified bodies, and with oxyhæmoglobin as his oxidizing agent? But the human body can do this.

Allow me to show you, by a simple example, how the passage of a substance through the body may illustrate the chemical processes of hydrolytic splitting, oxidation and synthesis. If Benzylamin be fed to a dog his urine will show a nearly corresponding amount of hippuric acid. The Benzylamin, $C_6 H_5 CH_2 NH_2$, takes up water and breaks up into Benzylalcohol, $C_6 H_5 CH_2 OH$ and ammonia, NH_3. The Benzylalcohol is then oxidized to Benzoic acid, $C_6 H_5 . COOH$, which combines with amidoacetic acid or glycocoll, to form Benzamido-acetic acid, or as it usually called Hippuric acid. The Ammonia, the other constituent of the Benzylamin, passes out of the body as urea. But this experiment, while thus illustrating certain elementary chemical processes that take place in the animal organism, also demonstrates the possibility of directing the metabolism of the body into new channels. Thus the glycocoll that has been carried out of the body by the benzoic acid, is ordinarily oxidized to water, carbonic acid and urea, and what escapes this oxidation is used in the synthesis of uric acid. Other instances of synthetical operations, in which metabolism is directed into new channels, can be cited. If camphor, menthol, chloral, indol, skatol, euxanthon, or any one of a large number of other substances, mostly substituted alcohols, ketones or oxyketones, be fed to an animal, they will be excreted in the urine as conjugated glycuronic acids. This glycuronic acid is however only a stage in the oxidation of grape sugar, possessing the properties of an aldehyde on the one hand and of an acid on the other, and if not interfered with is oxidized to carbonic acid and water. When one of the above mentioned substances is given, glycuronic acid is detailed to protect the body and show the enemy across the border. I could give you instances, like the first example, where the steps preceding the final elimination are comparatively simple. But as a rule these intermediate steps are withheld from our knowledge, and when we do hit upon them by experiment or inference we can only surmise in what parts of the body they occur. Take one of the simpler cases cited above, that in which camphor has been administered. The camphor, $C_8 H_{14} \begin{cases} CH_2 \\ CO \end{cases}$ becomes $C_8 H_{14} \begin{cases} CH.OH \\ CO \end{cases}$ that is, it has been oxidized to camphorol, which then combines with glycuronic acid, CHO (CH.OH) COOH, under accompanying dehydration, to be excreted as campho-

1. Pohl, Verhandl. d. X Intern. Med. Congr. Bd. II, IV abth., p. 34 and Archiv. f. Exp. Path. u. Pharmak. Bd.

2. *Kostanecki, Ber. d. deutsch. chem. Gesell. Bd. 19, p. 2919.

3. *I find in my lecture notes of Prof. v. Nencki's lectures that the crude coloring matter called Purree, is secured in parts of India by feeding cows with the leaves of a mango tree and evaporating their urine. The animals get diseased kidneys in time, and the same is true of rabbits fed with Euxanthon.

glykuronic acid.[1] The intermediate steps in this case, as in many others, are simple, but where do they take place, by what agencies does the body effect the dehydration accompanying the final synthesis? These are among the burning questions of Pharmacology. That complex of specialized cells, called an animal, is a factory into which we see raw products carried, and out of which we see the most wonderful and varied chemicals transported, but we may not see what goes on within. I have added this well worn comparison to the foregoing remarks to bring home to you more forcibly how baffled are our best efforts when we introduce chemical agents into a diseased body in the hope of directing metabolic processes as we would. *We cannot put our drugs where we want them.* We introduce them into the circulation and then stand by helpless spectators of a sequence of symptoms. To be sure we now use these effects to combat disease, and wisely hold to what every day experience teaches, in themean while hoping that the future will bring more light.

THE RELATION OF PHARMACY TO MEDICINE.

By Victor C. Vaughan.

Mr. President and Gentlemen of the Michigan State Pharmaceutical Association.

In the first place, I desire to thank you for giving me this opportunity of saying a few words to you. I wish to speak briefly of the relation between the professions of medicine and pharmacy. In the early development of science, the medicine man was both pharmacist and physician. He selected the mineral agents which he desired to employ therapeutically. He gathered the roots, leaves and barks, prepared his own infusions, decoctions and extracts, and administered the same. However slightingly we may be inclined to speak of these, our ancestors in pharmacy and medicine, we must acknowledge that there were wise men among them, and although many of their writings may have been tinctured with credulity and superstition, we must admit that they desired a better and more perfect knowledge, and it is possible that some of them dreamed of a day of scientific accuracy, which we have not yet seen. These men became acquainted with the toxicological and therapeutical properties of many drugs, and this knowledge was generally employed humanely and advantageously. As the number of facts became greater, it was seen to be wise that some should be selected for the purpose of supplying the articles of the Materia Medica, while others should give their time and attention to the therapeutical uses of the same. After this manner, the sciences of medicine and pharmacy came into existence. One is the complement of the other. The two are mutually dependent. A real advance in one can not do otherwise than enhance the value of the other. At first it was necessary for the pharmacist to be thoroughly acquainted with the physical properties of crude drugs. He knew the botanical characters of the growing plants, and he made himself familiar with the solubility of the various organic compounds employed by the physician. He was compelled to depend largely upon the color, taste, odor and gross structure of the articles which composed his stock. He endeavored to familiarize himself with the best methods of preparing his infusions, decoctions and extracts, so that they might be both palatable and efficient.

At a later period it was found that the virtue of most medicinal plants is due to certain active principles, which can be extracted and obtained in a state of chemical purity. This was an important discovery. It decreased the amount of the dose required to produce a given result. Medicines could now be administered in more compact form and were less repugnant to the taste. The inert parts of the plant were discarded as not only useless, but often deranging the digestive organs and leading to nausea and other unpleasant effects. Moreover, accuracy in size of dose, a great desideratum in medication, was more nearly secured. The great variability in the amount of crude drug necessary to produce a result was now understood.

1. Schmiedeberg & Maer, Zeitschrift f. physiolog. Chemie Bd III. pp. 422-460.

We hardly appreciate, now that we have morphine, atropine, strychnine, etc., the great advance which was secured to both pharmacy and medicine by the discovery and isolation of the vegetable alkaloids.

I believe that I am right in saying that for this great improvement we are largely indebted to the pharmacist. Indeed, if I am not mistaken, it was the apothecary, Sertürner, who first detected and isolated morphine and other alkaloids from opium. Not only is this true, but the whole scientific world is indebted to the Swedish pharmacist, Scheele, for many of the most important discoveries in chemistry. Ladenburg is not unwarrantably eulogistic when he says that Scheele accomplished the most important discoveries with the least equipment of any chemist who has ever lived, and moreover, that the accuracy of his work has best withstood the methods of modern research. It is said that somewhat more than one hundred years ago, while the king of Sweden was visiting Paris, and being entertained, dined and wined in royal style, he found the French constantly congratulating him on being the king of a country which produced a Scheele. The king, before leaving his native country, had never heard of this renowned scientist, and as he sat at the richly laden tables in Paris, sipping his wine and listening to their congratulatory speeches, he kept asking himself and his royal attendants, "Who in the deuce is this Scheele, anyhow?" But he found that the members of his retinue were no wiser on this important subject than his own royal highness. Finally, while he accepted the congratulations and sought for information, he dispatched a courier to Sweden with the imperial command to find this wonderful man, with whose praises the whole of France was ringing, and having found him to confer upon him the order of knighthood. The courier hastened to the capital of Sweden and made diligent search throughout the kingdom, but the only man bearing the favored name who could be found was a young lieutenant in the army, who, much to his own surprise and amazement, was with great pomp and ceremony invested with the dignity of knighthood, while the real Scheele, the poor apothecary, continued his work in obscurity, and died unknown to his king and unhonored by his countrymen.

I must be permitted to mention one other instance of the indebtedness of medicine to pharmacy. The surgeon of today, as he performs the heroic operations which have made his name renowned throughout the world, should remember that he is indebted for the anæsthetic, chloroform, to a comparatively unknown pharmacist of Sackett's Harbor, N. Y., who in 1831 first prepared this compound.

Many other instances of a similar nature might possibly be found, but I must hasten to say the few words which make the burden of my talk.

By the perfection of the microscope the pharmacist was supplied with an improved means of recognizing the true character of his drugs. Form and color are variable, smell and taste are subjective, and consequently often unreliable, but upon these means of recognition, the druggist of fifty years and more ago had to depend very largely, and it must not be supposed that a knowledge of these properties is at present without value. Indeed, all of you appreciate the importance of having the student of pharmacy thoroughly familiar with the form, color, taste and smell of many crude drugs. Your State Board of Examiners, as is shown by the examination papers which I have seen, does not underestimate the importance of this knowledge. But in many instances, especially in the detection of adulterations in powdered drugs, the most skilled pharmacist cannot be positive in his knowledge until he has studied the microscopical structure of the particles. To illustrate, how can the presence of lycopodium and starches in powdered drugs be detected with more ease and certainty than by microscopical examination? The most widely learned botanist will not pretend that he can always name the plants from a study of a bit of the dried root, yet this is the only portion of the plant which in many instances is in the possession of the pharmacist. Moreover, it is demanded of him that his knowledge be positive. It will not do for him to believe that he has the drug demanded, but he must know. The study of pharmacognosy thus becomes one of the fundamental branches in pharmaceutical training. It

is with the knowledge thus gained that the druggist makes, to speak in medical terms, his diagnosis. Wigand very properly says that pharmacognosy is an art with scientific methods of investigation. Skill in the recognition of crude drugs cannot be acquired by a study of books. The instructions must be given by the methods of the laboratory. The student must observe for himself. He must so familiarize himself with the general physical properties of the crude drugs that he recognizes them as he does his friends whom he meets on the street, at a glance. However, this is not always possible, and the student must come to know those drugs, which he cannot recognize by their physical properties, by the more exact information which he can gain by a study of their microscopical structure. The importance of pharmacognosy is thoroughly appreciated by the dean of the Department of Pharmacy of this University, and I am sure that all of you, who have not done so, will find pleasure in a visit to the rooms in which this work is done.

I have been frequently asked if it would not be well for medical students to take a course in the identification of crude drugs. In reply to this, I have said that while the knowledge gained from such instruction might in a small number of instances prove of practical value to the physician, it does not constitute any legitimate part of a medical curriculum. I do not think that it would be well for the physician himself or for his patient, should he return to the ancient method of preparing the medicines which he prescribes. The physician has the right to demand of his pharmacist that his prescriptions shall be filled with pure drugs—not with drugs which the pharmacist believes to be pure, but which he knows to be pure. The medical profession has the right to ask that your ranks be filled with men who know how to identify the drugs which they dispense. The physician has enough to do in familiarizing himself with the physiological and therapeutical effects of these drugs. In my opinion it would be of far more importance and value to our medical students to give them lessons in cooking than in pharmacognosy. In many diseases the food supplied the patient is of much more importance than the medicines, and moreover, the intelligence of the average cook is not great, while that of the pharmacist will compare very favorably with that of the physician. Indeed, in this state, with such an excellent board of examiners as you have, and with no restriction upon the practitioners of medicine, I fear that a comparison of the average intelligence in the two professions would not make a very creditable showing for medicine.

However, pharmacy covers a broader field than pharmacognosy. The latter is only a part of the former. Many drugs are not derived from the vegetable kingdom and cannot be identified by physical properties or microscopical examination. The pharmacist must study chemistry as well as pharmacognosy. Indeed, of these two sciences the former constantly grows in importance, while the latter shows a marked tendency to become more restricted in its practical application. We say that the physician seldom has occasion to see the crude drug. It is not improbable that the time will soon come when the same may be said with equal truth of the retail pharmacist. In the first place there are the inorganic preparations employed in medicine, as the salts of mercury, copper, silver, iron, zinc, potassium, sodium, lithium, etc., which make up a large part of the stock of the druggist, and which can be identified only by chemical tests. Second, there are the vegetable alkaloids and other active principles which have no characteristic physical properties or unvarying microscopical form, and for the identification of which chemistry must be employed. Third, the retail pharmacist now buys many of his tinctures, extracts and abstracts. All the portions of the plant having any characteristic physical properties or microscopical structure have been discarded before the drug reaches the retail dealer or the prescription clerk. Again, chemical methods are the only ones of which he can avail himself in the identification or in the detection of adulterations. Probably there are no other classes of standard drugs now prescribed which are so variable in their strength as these. This is shown by the late reports of Prof. Caldwell to the N. Y. State Board of Health. This chemist found that 100 grains of the tincture of opium varied in the

amounts of contained morphine from 0.32 to 1.41 grain. In other words, some samples of laudanum contain 4½ times as much morphine as other samples. What reliance can a physician place in a drug which shows such a marked variation as this? Suppose that in the treatment of a patient he is compelled to push morphine narcosis nearly to the danger line. He has been giving so many drops of the weak preparation, this supply is exhausted and he sends to the pharmacist for more; suppose that he is now supplied with a preparation 4½ times as strong, and the administration of this is continued in the same doses and at the same intervals as before. The physician returns to his patient after a few hours and finds that he is dead or hopelessly narcotized. But the physician who, aware of the great uncertainty in the strength of the tincture of opium, thinks that he will avoid all risk by the employment of morphine pills or tablets may make even a greater or more fatal mistake. Not one of the ¼ grain morphine tablets examined by Prof. Caldwell was found to yield this amount of morphine, the quantity actually found varied from a little more than one-fifth to less than one-eleventh of a grain. We will not buy a silver spoon without the most minute inquiry as to the amount of silver which it actually contains, but this report shows that physicians are using hypodermic tablets of morphine, all marked one-fourth of grain, which actually vary in strength from one-fifth to one-eleventh of a grain. This is not as it should be.

I hope that it will not be understood from what I have said that I believe that many deaths are due to this cause. The extreme case which I have supposed seldom exists in fact. Doses of morphine or tincture of opium are not given at stated intervals and without any reference to the condition of the patient at the time. In fact, I believe that deaths from morphine therapeutically administered very seldom occur, but the fact holds good that the physician would have much greater power in the treatment of disease were the medicines which he employs more uniform in strength. In fact this accuracy in dosage is absolutely essential to the best professional work, and uniformity in the strength of medicines should be secured in some way. How can it be done? Two answers suggest themselves to this question. First, every pharmacist must himself assay the more potent preparations which he buys. Certainly every pharmacist should be able to do this work. The second and more feasible plan would be for the physicians and pharmacists of the country to employ a chemist to whom samples could be submitted for assay at any time. In the meantime it is certainly the duty of the pharmacist to buy his drugs from the best and most honorable manufacturers, even if the prices demanded are greater than those at which others offer the same articles. The skilled workman does his best work with sharp tools, but he makes a bungling job if the knife is of varying temper. The physician needs powerful drugs. It is often essential that he relieve pain speedily and wholly, and the best results cannot be attained by the employment of drugs of uncertain strength. The medical profession looks to you for the correction of this complaint.

Again, the fact that many of the most potent drugs are now made synthetically leads to an increased demand for knowledge of chemistry on the part of the pharmacist. How can the prescription clerk know anything of the action of oxidizing and reducing agents upon antipyrine, antifebrine and phenacetin if he is ignorant of organic chemistry? It is highly probable that the number of these synthetical compounds employed in medicine will be greatly increased in the near future, and this will call for an extension of the course in organic chemistry given to students of pharmacy. A few years ago it was plainly taught in our books that there is no relation between chemical composition and physiological action. We now know that this is not true, and a class of hypnotics has been prepared artificially, and their physiological action can be predicted with considerable accuracy from their chemical composition. This field, which was first discovered by Liebreich in his studies on the action of chloral hydrate, in 1868, promises much for medicine, and with this increased knowledge pharmacy must keep pace.

To conclude, we may say that the pharmacy student should have a thorough drill in the recognition of crude drugs by their physical properties, and he should employ the microscope in the detection of falsifications. He must be a scientific chemist, acquainted with the knowledge which both inorganic and organic chemistry afford. He must be able to assay all his alkaloidal preparations and must guarantee the purity of the medicines which he dispenses. To these should be added skill in the compounding of prescriptions, and exactness which is demanded by a scientific conscience. It has been argued that since the large manufacturing chemists can prepare all drugs so cheaply, that the retail pharmacist need no longer be a man of knowledge and skill, and it has been predicted that he will degenerate into a mere dispenser of agents of which he has no scientific knowledge. This need not be, and cannot be, so long as your society and others of a similar character continue to do the good scientific work which you are doing.

SATURATION TABLES.

BY A. B. STEVENS, PH. C.

The saturation tables of the U. S. P. first appeared in the last edition of the Pharmacopœia. The tables occupy but six pages of the Pharmacopœia, yet they represent a vast amount of work. Each number is but the answer to a separate problem, representing 828 distinct problems. Were each problem fully expressed they would make a small volume. It is not surprising then that errors should occur in a work that has required weeks of mathematical calculation to complete it. The writer having had occasion to use these tables found several errors, and recognizing their value to the profession, undertook the laborious task of carefully revising them, that the existing Pharmacopœial errors might be corrected by the present committee on Revision and Publication. I have carefully gone over the entire work and a large portion of it more than once. There are a large number of changes that should not be considered as errors; for example: Sodium carbonate was considered as containing ninety-six per cent. of pure crystallized sodium carbonate, while the Pharmacopœia requires that it shall contain ninety-eight per cent. The difference is but slight, yet it was thought best to make the changes, that they might harmonize with the U. S. P. No changes were made in cases where only a slight variation in the decimal places existed, as these were doubtless due to the carrying out of the decimal places. All the corrections made have been verified by other calculators and have been verified a second time by myself.

Messrs. W. V. Fitch, R. Fischer and R. B. Armstrong have rendered able assistance.

It is feared that these tables are not fully understood or their value justly appreciated by the majority of pharmacists, and the writer recommends that their value be practically tested by each member of the profession.

SATURATION TABLES.

I. Table showing the Quantity of Official Alkalies required to Saturate 100 Parts of an Official Acid, together with the Quantity of Product.

ACIDUM.	ACIDS.	Ammonii Carbonas, 100 per cent.	Aqua Ammoniæ, 10 per cent.	Aqua Ammoniæ Fort, 28 per cent.	Product.	Potassa, 90 per cent.	Liquor Potassæ, 5 per cent.	Potassii Bicarbonas, 100 per cent.	Potassii Carbonas, 81 per cent.	Product.	Soda, 90 per cent.	Liquor Sodæ, 5 per cent.	Sodii Bicarbonas, 99 per cent.	Sodii Bicarbonas Venalis, 95 per cent.	Sodii Carbonas, 98 per cent.	Product.
	Of per cent.															
	Aceticum..... 36	31.40	102.00	36.43	46.20	37.33	672.00	60.00	51.11	58.80	26.66	480.00	50.91	53.05	87.55	81.60
	" Dilutum.. 6	5.23	17.00	6.07	7.70	6.22	112.00	10.00	8.52	9.80	4.44	80.00	8.49	8.84	14.58	13.60
	" Glaciale... 99	86.35	280.50	100.18	127.05	102.66	1848.00	165.00	140.53	161.70	73.32	1320.00	140.00	145.89	240.78	224.40
	Arseniosum..... 97	51.33	166.74	59.55	122.50	61.03	1098.54	98.08	83.55	143.10	43.59	784.62	83.22	84.94	143.11	127.46
	Benzoicum.....100	42.90	139.34	49.77	118.93	51.00	918.00	81.97	69.82	175.41	36.43	655.74	69.55	72.47	119.59	132.79
	Citricum.....100	74.76	242.86	86.73	124.29	88.89	1600.02	142.86	121.69	154.29	63.49	1142.82	121.21	126.32	208.45	170.90
	Hydrobromicum Dil 10	6.49	21.04	7.51	12.10	7.70	138.60	12.37	10.49	14.70	5.50	99.00	10.50	10.94	18.06	12.72
	Hydrochloricum....31.9	45.86	148.98	53.21	46.80	54.53	981.54	87.64	74.65	65.20	38.97	701.46	74.36	77.49	137.88	51.18
	" Dil 10	14.38	46.70	16.68	14.67	17.09	307.69	27.47	23.40	20.44	12.21	219.78	23.31	24.29	40.08	16.04
	Lacticum..... 75	43.61	141.67	50.60	89.17	51.85	933.33	83.33	70.99	106.67	37.04	666.67	70.71	73.68	121.59	93.63
	Nitricum.....69.4	57.64	187.24	66.88	88.13	68.54	1233.77	110.16	93.83	111.26	48.95	881.28	93.50	97.40	160.74	93.53
	" Dil..... 10	8.31	26.98	9.64	12.70	9.88	177.78	15.87	13.52	16.08	7.05	126.98	13.47	14.03	23.16	13.49
	Phosphoricum..... 50	58.40	178.47	61.95	67.35	68.49	1142.86	102.04	86.93	88.79	45.35	816.33	86.58	90.22	148.92	182.65
	" Dil... 10	10.68	34.69	12.39	13.47	12.70	228.57	20.41	17.39	17.76	9.07	163.27	17.32	18.04	29.77	36.53
	Salicylicum.....100	87.95	128.18	43.99	112.32	45.09	811.58	72.46	61.78	134.05	32.20	579.70	61.48	64.06	105.78	122.46
	Sulphuricum..... 96	102.53	333.06	118.95	129.30	121.90	2194.28	195.92	166.90	170.45	87.07	1567.35	166.23	173.23	285.88	315.43
	" Dil....9.6	10.25	33.31	11.90	12.98	12.19	219.43	19.59	16.69	17.05	8.71	156.73	16.62	17.32	28.59	31.54
	Tartaricum.....100	69.78	226.67	80.95	122.67	82.96	1493.33	133.33	113.58	156.67	59.26	1066.67	113.18	117.89	194.55	153.33

II. Table Showing the Quantity of Official Acids Required to Saturate 100 Parts of an Official Alkali, Together With the Quantity of Product.

ALKALIES.	Acidum Aceticum, 36 per cent.	Acidum Aceticum Dil. 6 per cent.	Acidum Aceticum, Glaciale, 99 per cent.	Product.	Acidum Arseniosum, 97 per cent.	Product.	Acidum Benzoicum, 100 per cent.	Product.	Acidum Citricum, 100 per cent.	Product.	Acidum Hydrobromicum Dilutum, 10 per cent.	Product.	Acidum Hydrochloricum, 31.9 per cent.	Acidum Hydrochloricum Dilutum, 10 per cent.	Product.
Of per cent.															
Ammonii Carbonas 100	318.47	1910.82	115.81	147.16	194.85	238.75	233.12	265.60	133.76	166.25	1543.95	186.88	218.04	695.54	102.04
Aqua Ammoniæ 10	98.03	588.18	35.65	45.30	59.97	73.47	71.76	81.76	41.18	51.08	475.29	57.53	67.12	214.12	31.41
Aqua Ammoniæ Fort... 28	274.48	1646.90	99.82	126.84	167.92	205.93	200.94	228.94	115.30	143.29	1330.81	161.08	187.94	599.54	87.95
Potassa 90	267.86	1607.16	97.40	157.50	163.86	234.48	196.07	343.92	112.50	173.57	1298.57	190.98	183.39	585.00	119.56
Liquor Potassæ..... 5	14.88	89.29	5.40	8.75	9.10	13.03	10.89	19.10	6.25	9.64	72.14	10.16	10.19	32.50	6.64
Potassii Bicarbonas....100	166.67	1000.00	60.60	98.00	101.96	145.90	122.00	214.00	70.00	108.00	808.00	118.80	114.11	364.00	74.40
Potassii Carbonas..... 81	195.65	1173.91	71.15	114.90	119.69	171.13	143.22	251.22	82.18	126.78	948.52	139.46	133.95	427.30	87.34
Soda 90	375.00	2250.00	136.36	306.00	229.40	292.28	274.50	364.50	157.50	267.75	1818.00	231.30	256.74	819.00	131.40
Liquor Sodæ 5	20.83	125.00	7.58	17.06	12.74	16.35	15.25	20.25	8.75	14.87	101.00	12.85	14.26	45.50	7.30
Sodii Bicarbonas..... 99	196.42	1178.52	71.43	160.28	120.17	153.09	143.78	190.92	82.50	140.25	952.30	121.16	134.48	429.00	68.83
Sodii Bicarb. Venal.... 95	188.47	1130 82	68.53	153.81	115.30	146.91	137.98	183.32	79.16	134.58	913.81	116.26	129.03	411.66	66.05
Sodii Carbonas 98	114.20	685.31	41.54	93.20	69.87	89.02	83.60	11.02	47.97	81.55	553.73	70.45	78.19	249.45	40.02

II. Table Showing the Quantity of Official Acids Required to Saturate 100 Parts of an Official Alkali, Together With the Quantity of Product.—*Continued.*

ALKALIES.	Acidum Lacticum, 75 per cent.	Product.	Acidum Nitricum, 69.4 per cent.	Acidum Nitricum Dil. 10 per cent.	Product.	Acidum Phosphoricum 50 per cent.	Acidum Phosphoricum Dilutum, 10 per cent.	Product.	Acidum Salicylicum, 100 per cent.	Product.	Acidum Sulphuricum, 96 per cent.	Acidum Sulphuricum Dilutum, 9.6 per cent.	Product.	Acidum Tartaricum, 100 per cent.	Product.
Of per cent.															
Ammonii Carbonas....100	229.29	204.50	178.46	1203.82	152.87	187.26	936.30	126.11	263.69	296.28	97.53	975.31	126.11	43.31	175.83
Aqua Ammoniæ..... 10	70.59	62.94	53.40	370.59	47.06	57.64	288.21	38.82	81.18	91.17	30.03	300.22	38.82	44.12	54.12
Aqua Ammoniæ Fort. 28	197.65	176.23	149.52	1037.65	131.77	161.39	806.99	108.70	227.30	255.28	84.06	840.62	108.70	123.54	157.53
Potassa..... 90	192.86	205.71	145.89	1012.50	162.32	157.50	787.50	139.82	221.79	297.3	82.03	820.31	139.82	120.54	188.84
Liquor Potassæ..... 5	10.71	11.43	8.11	56.25	9.02	8.75	43.75	7.77	12.32	16.52	4.56	45.57	7.77	6.70	10.49
Potassii Bicarbonas....100	120.00	128.00	90.78	630.00	101.00	98.00	490.00	87.00	138.00	185.00	51.04	510.41	87.00	75.00	117.50
Potassii Carbonas..... 81	140.87	150.26	106.57	739.56	118.57	115.05	575.25	102.13	162.00	217.17	59.92	599.20	102.13	88.05	137.93
Soda..... 90	270.00	252.00	204.25	1417.50	191.25	220.50	1102.50	402.75	310.50	380.25	114.85	1148.50	362.25	168.75	258.75
Liquor Sodæ..... 5	15.00	14.00	11.35	78.75	10.62	12.25	61.25	23.38	17.25	21.13	6.38	63.80	20.13	9.37	14.38
Sodii Bicarbonas..... 99	141.43	132.00	106.99	742.50	100.18	115.50	577.50	210.96	162.64	199.18	60.15	601.56	189.70	88.39	135.54
Sodii Bicarb. Venal... 95	135.70	126.66	102.67	712.50	96.13	110.83	554.15	202.44	156.07	191.07	57.72	577.18	182.06	84.82	130.06
Sodii Carbonas..... 98	82.23	76.75	62.24	431.74	58.25	67.16	335.80	122.67	94.57	115.80	34.98	349.80	110.33	51.39	78.80

III. Table Showing the Quantity of Official Alkalies and Acids Required to Make 100 Parts of Salt.

AMMONIUM SALTS.	Parts of Alkali Required.			Parts of Acid Required.	
	Ammonium Carbonate, (100 per cent. = 32.46 per cent. NH_3.)	Water of Ammonia, 10 per cent.	Stronger Water of Ammonia, 28 per cent.		*Of per cent*
Ammonium Acetate....$NH_4C_2H_3O_2$; 77	67.96	220.80	78.86	216.44	Acetic 36.
				1298.66	" Dil 6.
				78.71	" Glacial 99.
" Arsenite...NH_4AsO_2; 124.9	41.89	136.10	48.61	81.63	Arsenious 97.
" Benzoate..$NH_4C_7H_5O_2$; 139.0	37.64	122.30	43.68	87.77	Benzoic 100.
" Bromide...NH_4Br; 97.8	53.49	173.80	62.07	826.20	Hydrobromic Dil 10.
" Chloride...NH_4Cl; 53.4	98.00	318.40	113.71	213.67	Hydrochloric 31.9
				681.60	" Dil 10.
" Citrate....$(NH_4)_3C_6H_5O_7,H_2O$; 261	60.14	195.40	69.79	80.46	Citric 100.
" Lactate....$NH_4C_3H_5O_3$; 107	48.91	158.90	56.75	112.15	Lactic 75.
" Nitrate....NH_4NO_3; 80	65.40	212.50	75.89	113.47	Nitric 69.4
				787.50	" Dil 10.
" Phosphate.$(NH_4)_2HPO_4$; 132	79.29	257.60	92.00	148.48	Phosphoric 50.
				742.40	" Dil 10.
" Salicylate..$NH_4C_7H_5O_3$; 155	33.76	109.70	39.18	89.03	Salicylic 100.
" Sulphate...$(NH_4)_2SO_4$; 132	79.29	257.60	92.00	77.33	Sulphuric 96.
				773.36	" Dil 9.6
" Tartrate....$(NH_4)_2C_4H_4O_6$; 184	56.88	184.80	66.00	81.52	Tartaric 100.

III. Table Showing the Quantity of Official Alkalies and Acids Required to Make 100 Parts of Salt.—*Continued.*

POTASSIUM SALTS.	Parts of Alkali Required.				Parts of Acid Required.		
	Potassa, 90 per cent.	Solution of Potassa, 5 per cent.	Potassium Bicarbonate, 100 per cent.	Potassium Carbonate, 81 per cent.			*Of per cent.*
Potassium Acetate....$KC_2H_3O_2$; 98	63.49	1142.90	102.04	86.92	170.12	Acetic	36.
					1020.72	" Dil	6.
					61.86	" Glacial	99.
" Arsenite....$KAsO_2$; 145.9	42.65	767.64	68.54	58.38	69.88	Arsenious	97.
" Benzoate....$KC_7H_5O_2.3H_2O$; 214	29.08	523.37	46.72	39.81	57.01	Benzoic	100.
" Bromide....KBr; 118.8	52.88	942.82	84.18	71.76	680.13	Hydrobromic Dil	10.
" Chloride... KCl; 74.4	83.63	1505.39	134.41	114.49	153.37	Hydrochloric	31.9
					489.25	" Dil	10.
" Citrate.....$K_3C_6H_5O_7.H_2O$; 324	57.62	1037.16	92.59	78.88	64.81	Citric	100.
" Lactate.....$KC_3H_5O_3$; 128	48.61	875.00	78.13	66.55	93.75	Lactic	75.
" Nitrate.....KNO_3; 101	61.61	1108.91	99.01	84.34	89.88	Nitric	69.4
					623.76	" Dil	10.
" Phosphate..K_2HPO_4; 174	71.52	1287.36	114.95	97.91	112.60	Phosphoric	50.
					563.22	" Dil	10.
" Salicylate..$2KC_7H_5O_3.H_2O$; 370	33.63	605.39	54.05	46.04	74.59	Salicylic	100.
" Sulphate...K_2SO_4; 174	71.52	1287.36	114.95	97.91	58.67	Sulphuric	96.
					586.69	" Dil	9.6
" Tartrate....$2K_2C_4H_4O_6.H_2O$; 470	52.96	953.19	85.11	72.50	63.83	Tartaric	100.

III. Table Showing the Quantity of Official Alkalies and Acids Required to Make 100 Parts of Salt.—*Continued.*

SODIUM SALTS.	Parts of Alkali Required.					Parts of Acid Required.		
	Soda, 90 per cent.	Solution of Soda, 5 per cent.	Sodium Bicarbonate, 99 per cent.	Commercial Sodium Bicarbonate, 95 per cent.	Sodium Carbonate, 98 per cent.			*Of per cent.*
Sodium Acetate.....$NaC_2H_3O_2.3H_2O$; 136	32.68	588.23	62.39	65.02	107.28	122.55 735.29 44.55	Acetic..... " Dil..... " Glacial.....	36 6 99
" Arsenite.....$NaAsO_2$, 129.9..	34.21	615.86	65.32	68.07	112.31	78.49	Arsenious.....	97
" Benzoate.....$NaC_7H_5O_2.H_2O$; 162.....	27.43	493.82	52.38	54.58	90.06	75.31	Benzoic.....	100
" Bromide.....NaBr; 102.8.....	43.23	778.21	82.54	86.01	141.92	785.99	Hydrobromic.....	10
" Chloride.....NaCl; 58.4.....	76.10	1369.86	145.29	151.41	249.82	195.38 623.27	Hydrochloric..... " Dil.....	31.9 10
" Citrate.....$Na_3C_6H_5O_7.5\frac{1}{2}H_2O$; 357..	37.35	672.27	71.33	74.30	122.60	58.82	Citric.....	100
" Lactate.....$NaC_3H_5O_3$; 112.....	39.68	714.29	75.76	78.95	130.27	107.14	Lactic.....	75
" Nitrate.....$NaNO_3$; 85.....	52.29	941.18	99.82	104.02	171.64	106.80 741.18	Nitric..... " Dil	69.4 10
" Phosphate....$Na_2HPO_4.12H_2O$; 358.....	24.83	446.92	47.40	49.40	81.51	54.75 273.74	Phosphoric..... " Dil.	50 10
" Salicylate ...$2NaC_7H_5O_3.H_2O$; 338. ...	26.27	473.37	50.21	52.32	86.30	81.66	Salicylic	100
" Sulphate.....$Na_2SO_4.10H_2O$; 322.....	27.60	496.89	52.70	54.92	90.62	31.70 317.08	Sulphuric. ..... " Dil.....	96 9.6
" Tartrate.....$Na_2C_4H_4O_6$. $2H_2O$; 230....	38.65	695.65	73.78	76.89	126.86	65.22	Tartaric.....	100

REPORT OF COMMITTEE TO SECURE EXPRESSION OF MEMBERS OF THE ASSOCIATION REGARDING APPOINTMENT OF MEMBER OF THE BOARD OF PHARMAY.

Mr. Jas. Vernor was supplied with 3,000 circulars for distribution to registered pharmacists of the state, asking each to name one person to succeed the outgoing member of the Board. These circulars embraced voting slips, and presented the following names: C. A. Bugbee, Cheboygan; L. A. Goodrich, Hillsdale; F. Inglis, Detroit; S. E. Parkill, Owosso; C. W. Parsons, Detroit; J. E. Peck, Grand Rapids; D. E. Prall, Saginaw; H. W. Snow, Detroit; H. Thum, Grand Rapids; J. B. Watson, Coopersville; F. J. Wurzburg, Grand Rapids. The result of the vote is thus tabulated.

	Members.	Non-Members.	Dropped.	Illegible.	Total.
Bugbee, Charles A....	62	17	2	3	84
Parkill, Stanley E.....	59	57	9	1	126
Inglis, Frank.....	11	14	3	1	29
Prall, D. E	11	9	–	–	20
Goodrich, L. A.....	9	21	–	–	30
Peck, J. E.....	8	16	1	–	25
Wurzburg, F.....	6	5	–	–	11
Thum, H.....	5	7	–	–	12
Snow, H. W.....	4	2	–	–	6
Parsons, C. W.....	3	8	1	–	12
Jesson, J.....	1	2	1	–	4
McDonald, Geo.....	1	–	–	–	1
Merrill.....	1	–	–	–	1
Alsdorf, F.....	1	3	–	–	4
Webb, E. T.....	1	1	–	–	2
Harwood, G.....	–	1	–	–	1
Stone.....	–	1	–	–	1
Colman, H. G.....	–	1	–	–	1
Stafford.....	–	–	1	–	1
Everett.....	–	1	–	–	1
No Choice.....	2	–	–	–	2

As, by vote of the association, the ballots to be considered were those from members only, the committee carried out their instructions by forwarding the following letter.

December 7, 1891.

HON. EDWIN B. WINANS, Governor of Mich., Lansing, Mich.

Dear Sir—Referring to the inclosed circular you will notice the method devised by the Michigan State Pharmaceutical Association for obtaining the wishes of the druggists, members of that association, relative to the choice of one to succeed Mr. Stanley E. Parkill, the outgoing member of the State Board of Pharmacy, whose term of office expires December 31st. This method is similar to that followed last year.

The undersigned committee have carried out the instructions given them by the association, and herewith transmit to you the result of the ballot cast for member of the board of pharmacy. Of the total number of votes cast

Mr. Chas. A. Bugbee, of Cheboygan.....received 62
Mr. Stanley E. Parkill, of Owosso..... " 59
Mr. Frank Inglis, of Detroit..... " 11
Mr. D. E. Prall, of Saginaw..... " 11
Mr. L. A. Goodrich, of Hillsdale ..... " 9

In addition a number of votes were received, scattering for various persons.

The five names submitted to you stand at the head of the list of candidates for this appointment. They are brought to your notice with the request of this association that you kindly give them your consideration. Similar suggestions in the past have been favorably received, and the committee beg that you will grant this like consideration. We remain,

Most respectfully,

Committee: { CHAS. W. PARSONS, Chairman.
J. W. CALDWELL.
E. T. WEBB.

EMPLOYMENT OF AN ATTORNEY BY THE BOARD OF PHARMACY.

In pursuance of the directions of the association (see p. 21), the secretary held the following correspondence with the Board of State Auditors.

Board of State Auditors, Lansing, Mich.

October 26, 1891.

GENTLEMEN:—I am instructed to forward you the resolutions following, adopted by the Michigan State Pharmaceutical Association at its meeting in Ann Arbor, October 21, 1891. These resolutions were accorded the unanimous approval of the convention, and the secretary was instructed to hand them to you for your earnest consideration and action.

WHEREAS:—It having come to the knowledge of the Michigan State Pharmaceutical Association, that the Board of State Auditors have recently notified the Board of Pharmacy to discontinue the practice of employing legal assistance in the prosecutions of violations of the pharmacy law, and,

WHEREAS:—The pharmacists of the State of Michigan, of which this is a representative body, drafted and submitted the said law to the legislature by which it was passed, and have furthermore defrayed the entire expense of the maintenance of the board of pharmacy since its origin, therefore be it

Resolved, That in our opinion is was the intention of the law to allow the Board of Pharmacy to employ legal assistance in the investigation and prosecution of complaints of violation of the law, and their action in so doing in the past meets with our hearty sanction and approval, and further

Resolved, That the Board of State Auditors be and they are hereby requested to reverse the decision recently made by them, that the Board of Pharmacy may again resume the practice of employing legal assistance whenever it may seem to them proper to do so in the investigation and prosecution of violations of the law.

Resolved, That the secretary be and he is hereby directed to send a copy of these resolutions to the clerk of the Board of State Auditors.

I beg to remain,

Very truly yours,
CHARLES W. PARSONS,
Secretary, Michigan Pharmaceutical Association.

Board of State Auditors, Lansing, Mich.

October 27, 1891.

MR. CHARLES W. PARSONS, Secretary Michigan Pharmaceutical Association.

SIR:—Your communication of the 26th, with resolutions received and will be presented to the Board at its next meeting.

It is very probable that they will refuse to "reverse their decision" as they considered that they were very lenient in allowing the past expenses in this matter at all, considering the details of the vouchers presented, which under the head of legal assistance and detective work, covered expenses perhaps of a foreign character and with results hardly commensurate with the cost. As to whether the pharmacists have "defrayed the entire expenses of the maintenance of the Board of Pharmacy since its origin," although we grant that the fees are originally collected from them, it is a matter so axiomatic and generally conceded that all such expenses ultimately fall upon the consumers, the people, that the law very wisely required reports to the governor and settlements somewhere and a place of deposit of all surplus, viz., the State treasury, and the pharmacists themselves who originally advance these fees should be pleased at a careful rather than a careless accounting with this Board.

Very Respectfully,
W. H. S. WOOD,
Clerk of Board of State Auditors.

Board of State Auditors, Lansing, Mich.

October, 28, 1891.

MR. CHARLES W. PARSONS, Secretary Michigan Pharmaceutical Association.

SIR:—Resolutions of October 21, were today presented to the Board and they decline to reconsider the position already taken.

They find even in 1888, $25 was paid for opinion by a Detroit lawyer as to patent medicine. The legal adviser of all state officers and boards is the Attorney General and the county prosecuting officer is the prosecuting attorney.

Very Respectfully,
W. H. S. WOOD,
Clerk of Board of State Auditors.

DETROIT, November 26th, 1891.

MR. C. W. PARSONS,
Secy. M. S. P. A.

DEAR SIR:—

I am happy to be able to inform you that the effort of the Association to uphold the hands of the Board of Pharmacy was not useless, as the Board of State Auditors have this day notified me, that, "The Board allows $5.00 per day and expenses, for investigating necessary cases of violation." The Board of Pharmacy now feel that having been allowed to employ an Attorney, they can again take up the very important feature of their work that they were obliged to drop for almost six months, by reason of the former action of the Board of State Auditors.

Thanking you for your personal efforts in this matter, I remain,

Very Respectfully Yours,
JAMES VERNOR,
Secretary.

CONSTITUTION AND BY-LAWS.

ADOPTED AT PETOSKEY, MICHIGAN, JULY 13TH, 1887.

PREAMBLE.

WHEREAS, Organization, concert of action, and comparison of ideas are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore.

Resolved, That we, druggists of the State of Michigan, whose names are hereunto attached, in compliance with an act entitled An Act to Organize the reputable Pharmacists of the State of Michigan into an Association to be known as the Michigan Pharmaceutical Association, approved April 1887, do hereby organize ourselves into such Association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The object of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard, and, ultimately, to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.—MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.—OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected by ballot at the third sitting of the regular annual meeting of the Association, and to serve until their successor are elected.

ARTICLE V.—DUTIES OF OFFICERS.

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, until the close of such meetings; call special meetings at the written request of twenty-five members; fill all vacancies that may occur in the offices of the Association between the annual meetings; shall present at each meeting a report of the Association, and perform such other duties as pertain to the office.

SECTION 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election and furnish each member of the committees with the names of their associates on said committees. He shall

receive and collect all monies for dues, and from all other sources, giving receipts for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee. He shall file a copy of the proceedings of each annual meeting in the office of the State Board of Health, and the Secretary of State, and shall keep at least three copies in his own office.

SECTION 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the president, render a full report of his transactions at each annual meeting, and report the state of the treasury when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

SECTION 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without necessary delay, all papers and property of the Association committed to their care.

SECTION 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.—MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.—BY-LAWS.

This Association may establish for its future government and regulation, such By Laws, not in conflict with the Constitution, as may be deemed proper and desirable.

ARTICLE VIII.—AMENDMENTS.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.—QUORUM.

Twelve members shall constitute a quorum.

ARTICLE II.—MEMBERSHIP.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented in writing, signed by two members in good standing, to the Executive Committee, and if favorably acted upon by that committee, the candidate shall be considered elected. A vote of all the members of the Executive Committee shall be required for an election.

ARTICLE III.—FEES.

The initiation fee of this Association shall be one dollar, which fee shall accompany the application.

ARTICLE IV.—DUES.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.--CERTIFICATE OF MEMBERSHIP.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.—COMMITTEES.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be an ex-officio member), each to consist of three members, viz: Committee on Trade Interests; Committee on Pharmacy and Queries; Committee on Legislation; Committee on Adulterations.

SECTION 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.

SECTION 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable, to be reported upon at the next annual meeting.

SECTION 4. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.—SUSPENSIONS—AMENDMENTS.

SECTION 1. These By-Laws shall not be suspended without the consent of two-thirds of the members present.

SECTION 2. Any amendment to these By-Laws must be made in writing and read before the Association at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these By-Laws.

ARTICLE VIII.—DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meeting of the American Pharmaceutical Association.

ARTICLE IX.—PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees and members, shall be published annually under the supervision of an editor, who shall be elected annually, and who shall be paid from the funds of the Association, and a copy of the proceedings shall be sent to each member of the Association less than two years in arrears.

ARTICLE X.—EXPULSION OF MEMBERS.

Any member or officer accused of violating the Constitution or By-Laws, or other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting. In every case definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the charges, and notify him in writing, at least two weeks in advance, of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense.

ARTICLE XI.—EXHIBITS.

The Association invites manufacturers and others to exhibit at the annual meetings, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.—RULES OF ORDER.—ORDER OF BUSINESS.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SECTION 2. The order of business shall be such as the Executive Committee shall prescribe.

THE PHARMACY LAW.

AN ACT

To regulate the practice of pharmacy in the State of Michigan.

(ACT NO. 134, LAWS OF 1885.)

SECTION 1. *The People of the State of Michigan enact,*. That the Governor, with the advice and consent of the Senate, shall, within thirty days after the passage of this act, appoint five persons and annually thereafter one person from among such competent pharmacists in the State as have had ten years practical experience in dispensing physicians' prescriptions, who shall constitute the Michigan Board of Pharmacy. The term of office of said five persons shall be so arranged that the term of one shall expire on the thirty-first day of December of each year, and all appointments made thereafter shall be for the term of five years.

SEC. 2. The said board shall, within thirty days after its appointment, meet, and organize by election of a president and secretary, from its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the board. It shall be duty of the board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to investigate complaints and to cause the prosecution of all persons violating its provisions; to report annually to the Governor, and to the Michigan Pharmaceutical Association upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said board for the year, and also the names of all pharmacists duly registered under this act; the board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties, at least once in four months, said meetings to be held on the first Tuesdays of March, July, and November in each year; shall make by-laws for the proper fulfilment of its duties under this act, and shall keep a book of registration in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. The records of said board, or a copy of any part thereof, certified by the secretary to be a true copy, attested by the seal of the board, shall be accepted as competent evidence in all courts of the State. Three members of said board shall constitute a quorum.

SEC. 3. The secretary of the board and the treasurer thereof, if such separate office be created, shall receive a salary which shall be fixed by the board; they shall also receive the amount of their traveling and other expenses incurred in the performance of their official duties. The other members shall receive the sum of three dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in the performance of their official duties. Said salaries, per diem and expenses shall be paid from the fees received under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be paid into the State treasury at the end of each year, and so much thereof as shall be necessary to meet the current expenses of said board shall be subject to the order thereof, if, in any year, the receipts of said board shall not be equal to its expenses. The board shall make an annual report and render an account to the Board of State Auditors and to the Michigan Pharmaceutical Association of all moneys received and disbursed by it pursuant to this act.

SEC. 4. Every person who shall, within three months after this act takes effect, forward the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State at the time this act takes effect, in the preparation of physicians' prescriptions, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist: *Provided*, That in case

of failure or neglect to register as herein provided, then such person shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy hereinafter described.

SEC. 5. No person other than a licentiate in pharmacy shall be entitled to registration as a pharmacist, except as provided in Section Four. Licentiates in pharmacy shall be such persons, not less than eighteen years of age, who shall have passed a satisfactory examination touching their competency before the Board of Pharmacy. Every such person shall, before an examination is granted, furnish satisfactory evidence that he is of temperate habits, and pay to the board a fee of three dollars: *Provided*, That in case of a failure of any applicant to pass a satisfactory examination, the money shall be held to his credit for a second examination at any time within one year. The said board may grant certificates of registration without further examination to the licentiates of such other boards of pharmacy as it may deem proper upon a payment of a fee of two dollars.

SEC. 6. The said board may grant, under such rules and regulations as it may deem proper, at a fee not exceeding one dollar, the certificate of registered assistant to clerks or assistants in pharmacy not less than eighteen years of age, who at the time this act takes effect shall be engaged in such service in this State, and have been employed or engaged two years or more in the practice of pharmacy, but such certificate shall not entitle the holder to engage in such business on his own account, or to take charge of or act as manager of a pharmacy or drug store.

SEC. 7. Each registered pharmacist, or registered assistant, who desires to continue the practice of his profession, shall annually, after the expiration of the first year of his registration, during the time he shall continue in such practice, on such date as the board of pharmacy may determine, pay to the said board a registration fee to be fixed by the board, but which shall not exceed one dollar for a pharmacist, or fifty cents for an assistant, for which he shall receive a renewal of said registration. Every person receiving a certificate under this act shall keep the same conspicuously exposed in his place of business. Every registered pharmacist, or assistant, shall, within ten days after changing his place of business or employment, as designated by his certificate, notify the secretary of the board of his new place of business. If any pharmacist or registered assistant shall fail or neglect to procure his annual registration, or to comply with the other provisions of this section, his right to act as such pharmacist or assistant shall cease at the expiration of ten days from the time notice of such failure to comply with the provisions of this section shall have been mailed to him by the secretary of said board.

SEC. 8. All or any registration obtained through false representations shall be void, and the board of pharmacy may hear complaints and evidence, and may revoke such certificates as it may deem improperly held.

SEC. 9. Any proprietor of a pharmacy who, not being a registered pharmacist, shall, ninety days after this act takes effect, fail or neglect to place in charge of such pharmacy a registered pharmacist, or any such proprietor who shall by himself, or any other person, permit the compounding or dispensing of prescriptions, or the vending of drugs, medicines, or poisons, in his store or place of business, except by or in the presence and under the supervision of a registered pharmacist, or except by a registered assistant; or any person not being a registered pharmacist who shall take charge of or act as manager of such pharmacy or store, or who, not being a registered pharmacist or registered assistant, shall retail, compound, or dispense drugs, medicines, or poisons, or any person violating any other provision of this act to which no other penalty is herein attached, shall be deemed guilty of a misdemeanor, and for every such offense, upon conviction thereof, shall be punished by a fine of not less than ten nor more than one hundred dollars, and in default of payment thereof shall be imprisoned not less than ten days nor more than ninety days, or both such fine and imprisonment, in the discretion of the court.

SEC. 10. Nothing in this act shall apply to, or in any manner interfere with, the business of any practicing physician who does not keep open shop for retailing, dispensing, or compounding of medicine and poison, or

prevent him from supplying to his patients such articles as may seem to him proper, nor with the vending of patent or proprietary medicines by any retail dealer *who has been in such business three years or more*, nor with the selling by any person of drugs, medicines, chemicals, essential oils and tinctures which are put up in bottles, boxes, packages, bearing labels securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons three months, six months, one year, three years, five years, ten years, fifteen years, and twenty-one years of age, and if a poison, the name or names of the most common antidotes; of copperas, borax, blue vitriol, saltpetre, pepper, sulphur, brimstone, paris green, liquorice, sage, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerine, Glauber salts, epsom salts, cream tartar, bi carbonate of soda, sugar of lead, and such acids as are used in coloring and tanning, nor with the selling of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, laudanum, quinine, and all other preparations of cinchona bark, tincture of aconite, and tincture of iron, compound cathartic pills, or quinine pills, nor with the exclusively wholesale business of any dealer: *Provided*, That every person who shall within three months after this act takes effect forward to the board of pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State, in the preparation of physicians' prescriptions, three years next previous to the second day of June, 1885, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist. *And provided further*, That the said board may grant, at a fee not exceeding one dollar, to such person not less than sixteen years of age who shall pass a satisfactory examination touching their competency before the board of pharmacy, the certificate of registered "assistant," but such certificate shall not entitle the holder to engage in business on his own account or to take charge of or act as manager of a pharmacy or drug store.

SEC. 11. No person shall add to or remove from any drug, medicine, chemical, pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value, or medicinal effect, or which shall alter the nature or composition of such drug, medicine, chemical, or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or purity. Any person who shall thus wilfully adulterate or alter, or cause to be adulterated or altered, or shall sell or offer for sale, any such drugs, medicine, chemical, or pharmaceutical preparation, or any person who shall substitute, or cause to be substituted, one material for another, with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. If convicted, he shall be liable to all the costs of the action, and for the first offense be liable to a fine of not less than ten dollars nor more than one hundred dollars, and for each subsequent offense a fine of not less than twenty-five dollars nor more than one hundred and fifty dollars. On complaint being entered the board of pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulteration, substitution, or alteration, and report upon the result of his investigation; and if said report shall be deemed to justify such action the board shall duly cause the prosecution of the offender, as provided in this act.

SEC. 12. The senior pharmacist of every house dispensing and compounding medicines, registered under this act, shall be exempt and free from all jury duty in the courts of this State.

SEC. 13. All acts and parts of acts in conflict with the provisions of this act are hereby repealed.

Approved June 2, 1885.

NOTE.—Section 10 in this Act is the Amended section, entitled an "Act to Amend Sec. 10," etc. Approved June 18, 1887.

REGISTERED PHARMACISTS IN MICHIGAN.

CERT. NO.	NAME AND RESIDENCE.
899	Perley L Abbey, Kalamazoo.
3101	Alfred J Abbott, Emmet.
1276	Erasmus D Abbott, Alba.
776	Frank E. Abbott, Sterling.
3102	Roy A. Abbott, Muskegon.
3575	Arthur W Adams, Bay City.
1657	Charles C. Adams, Alamo
350	Charles H. Adams, Allegan.
920	Henry M. Adams, Port Huron.
2518	James W. Adamson, South Bay City.
2435	Robert E. Adamson, Ubly.
697	Augustus Ahlborn, Detroit.
3008	John S Ahlborn, Detroit.
863	James V. Akey, Los Angeles, Cal.
830	Hila L. Alderman, Detroit.
2945	Ed C. Aldrich, Columbiaville
1389	William L. Aldrich, Maple Rapids.
1176	Albert W. Allen, Detroit.
3201	Archie C. Allen, Millington.
1765	Alfred Allen, Montague.
2946	C. Fred Allen, Adrian.
3103	Chalmers P. Allen, West Bay City.
902	Earl Allen, Grand Rapids
1262	Ely F. Allen, Grand Ledge.
3576	Harry E. Allen, Morenci
2748	Minnie L. Allen, Grand Ledge.
2917	William H. Allen, Detroit.
3104	Charles W. Allison, Lennon
3240	James E. Allworth, Battle Creek.
1562	Eugene H. Allyn, Dushville.
5	Cyrus Alsdorf, Lansing.
70	David F Alsdorf, Corunna.
4	Fred M. Alsdorf, Lansing.
3408	Dallas D Alton, Fremont.
1141	Charles B Alward, Camden.
188	Isaac Amberg, Battle Creek.
3224	Frank B. Ambler, Northville.
3489	Henry Ameel, Mt. Clemens.
681	Emil Ammerman, Iron River.
2853	William C. Ammerman, Escanaba.
3105	Edwin S Anderson, Detroit.
1563	Ellery Anderson, Midland.
334	Elmer A. Anderson, Gladwin
50	James H. Anderson, Denver, Col.
39	Henry L. Anthony, Sturgis.
1566	Maxon Anderson, Midland.
835	Eliza A. Andrews, Fennville.
287	Fred B. Andrews, Adrian.
1003	George R. Andrews, Le Roy.
3608	Henry W. Andrews, Adrian.
1147	Karl Andrews, Mt. Clemens.
1159	S. Newton Andrews, Flint
732	William H. Andrews, Fennville.
1395	Charles S. Andrus, Detroit.
3313	William W. Andrus, Utica.
1263	Henry Arbour, Delton.
1452	George W. Armes, Gaines.
3241	Charles E. Armstrong, Grand Rapids.
2540	Henry A. Armstrong, Omaha. Neb
1382	John W. Armstrong, Caledonia.
664	Rolla S. Armstrong, Chelsea.
33	William C. Arnold, Oklahoma, Ok. Ter.
2153	Hiram Arthur, Dowagiac.
2702	J L. Ash, Stetson.
315	Alfred J. Ashbreck, Bronson.
3577	Will F. Ashley, Medina, Ohio.
359	Frank E. Atchinson, Gladwin.
980	Charles Atkinson, Novi.
2018	Harry J. Atkinson, Michigamme.
156	Charles H. Atwater, Lapeer.
760	George O. Austin, Morrice
2272	Bryant E. Avery, Greenville.
2273	John Avery, Greenville.
2208	Alva C. Ayres, California.
2206	Ezra J. Ayres, California.
19	Henry Baar, Grand Haven.

CERT. NO.	NAME AND RESIDENCE.
65	Herman Baatz, Detroit.
1915	J. H. Hobart Babcock, Kalamazoo.
2278	Laban A. Babcock, Britton.
3551	William C. Babcock, Britton.
968	John Babington, Corunna.
577	Mortimer H. Bachman, Stanton,
1532	Mrs. J. W Backus, Marine City.
374	George Bacon, Shaftsburg.
375	Newton Bacon, Shaftsburg.
2144	Reuben D. Bacon, West Olive.
2799	George T. Bader, Detroit.
3314	George Henry Baert, Zeeland.
1021	Charles W. Bahel, Otsego Lake.
108	Charles G. Baier, Detroit.
1415	Phy. C Baily, Lake Linden.
929	Wallace F. Baily, Detroit.
766	George H. Bailey, Elk Rapids
773	Guy G Bailey, Mackinaw Island.
794	John R. Bailey, Mackinaw Island.
158	Matthew G Bailey, Mackinac Island.
2918	Charles Baker, Owosso.
3049	Charles P Baker, St. Johns.
688	Dennis Baker, Grand Rapids.
2436	Frank D. Baker, Flint.
3242	Fred W. Baker, Saginaw.
60	George F. Baker, Grand Rapids.
16	Harvey C. Baker, Detroit.
2112	Herbert G. Baker, Vicksburg.
191	Horace Baker, Tecumseh.
405	Robert Baker, Vicksburg.
86	William F. Baker, Detroit.
26	William H. Baker, Kansas City, Kan.
2229	R. A. Balcom, Laingsburg.
978	Charles L. Baldwin, Flint.
2844	Edward L. Baldwin, Detroit.
3490	William L. Baldwin, Vassar.
3491	Edwin Ballard, Saginaw.
695	Otis W. Ballard, Flushing.
3050	Wallace D. Ballou, Grand Rapids.
1761	G. Homer Bancroft, Milford.
3051	Fisks Bangs, Lansing.
3106	William Z. Bangs, Grand Rapids.
3052	Edward D. Banghart, Saginaw.
2741	Arthur D. Bangham, Homer.
3198	George E. Banks, Monroe, Wis.
2277	George E Bannister, Utica.
2809	John L. Bannister, East Saginaw.
716	George F. Barbarin, Freeland.
368	Levi A. Barber, Petoskey.
369	Myron A. Barber, Petoskey.
1171	Oliver Barber, Bay City.
2542	William O. Barber, Caledonia.
254	Frederick S. Barbour, Clifford.
757	Will G Barbour, Midland.
1319	George D. Barden, Woodland.
2519	Herman L. Barie, Detroit.
56	William J. Barker, Mt Pleasant.
318	Salma Barmore, Buchanan.
1477	Hiram S. Barnabee, Traverse City.
3478	William D. Barnard, Manistee.
1838	Chancey A. Barnes, Otsego.
1638	Henry C. Barnes, Quincy.
1063	Asa D. Barnham, Grand Ledge.
3156	John W. Barron, Coldwater.
1173	John F. Barrows, Lawrence.
3244	Benjamin T. Barry, Jackson.
1961	Frank Barry, Rodney.
1255	Henry Barry, Ravenna.
2381	William C. Barry, Springdale.
701	Frank D. Bartholomew, Blissfield.
2147	Harry W. Bartlett, Paw Paw.
1111	Walter W. Barton, Leland.
972	Earlum W. Bartram, Paw Paw.
1186	Arthur Bassett, Detroit.
866	Emmett C. Bassett, Ann Arbor.
967	James A. Bassett, Ypsilanti,

CERT. NO.	NAME AND RESIDENCE.
1006	Albert F. Batch, St. Louis.
2184	Clift C. Batcheler, Boyne City.
1097	Frank Bateman, South Bay City.
2186	Ansel W. Bates, Gaylord.
2139	Arthur W. Bates, Gaylord.
1103	John C. Bates, New Haven.
1073	Southmit S. Bates, Benedict.
1573	William A. Bates, Gaylord.
3017	William E. Bates, Chicago, Ill.
1913	Anton Christian Baur, Grand Rapids.
3237	Richard Baxter, Windsor, Ont.
942	Thomas A. Baxter, Grand Rapids
3245	John M. Bayes, Homer.
786	Lyman F. Beach, Bay City.
946	Clarence B. Beachum, Monroe.
3374	D. May Beachum, Romeo.
2919	Emery R. Beal, Ypsilanti.
93	Rollin H. Beal, Northville.
3220	Gordon W. Beall, East Jordan.
3578	Lucian M. Beall, Richland.
2650	George W. Beaman, Charlevoix.
324	Josiah D. Bean, Edwardsburg.
413	Josiah W. Bean, Edwardsburg.
873	George R. Beardsall, Hudson.
2906	Frank Beardsley, Hersey.
3409	Joseph H. Beckton, Fort Gratiot.
1106	Ezra Beckwith, Galesburg.
656	Rensselaer G. Beckwith, Bradley.
2437	Joseph Bedard, Muskegon.
2385	Conrad F. Beder, Caledonia.
13	Constantine Beebe, Ovid.
1033	Edward D. Beebe, Ovid.
1084	George C. Beebe, Bay City.
2654	Henry Beebe, Alpena.
2749	Hosmer P. Beebe, Big Rapids
2101	Justus Beebe, Oakland.
3316	Lora W. Beebe, West Superior, Wis.
1821	Birten N. Beeden, Detroit.
1795	August A. Begrow, Detroit.
1796	Herbert G. Begrow, Detroit.
630	John Bell, Lexington.
2227	John Bell, Benton Harbor
2833	John N. Bell, Detroit.
2947	Oliver S. Bell, Windsor, Ont.
3230	Arthur W. Bellows, Detroit.
2776	William E. Belsher, Saginaw.
2056	John C. Benbow, Harrietta.
3317	William I. Benedict, Pontiac.
2659	James C. Benham, Montgomery.
208	Charles W. Bennett, Quincy.
2948	John F. Bennett, Detroit.
1274	John R. Bennett, Muskegon.
1882	John S. Bennett, Lansing.
1478	Lewis T. Bennett, Port Huron
839	Townsend O. Bennett, Milford.
1994	Ambrose W. Benton, Bailey
2209	Ira R. Bentz, Jonesville.
869	Gustav Berg, Detroit.
2382	Victor A. Bergeron, Muskegon.
1912	Charles S. Berridge, Orion.
1911	Mary L. Berridge, Orion.
991	Walter H. Berridge, Flint.
2210	Erastus Berry, Bellevue.
3243	Borthold F. Bertram, Detroit.
790	John P. Bertram, Westphalia.
2704	Peter J. Beyer, Harbor Springs.
2052	Charles P. Bigelow, Big Rapids
2897	Edwin B. Bigelow, Jackson
2418	Munson J. Bigelow, Reading.
2735	Rolla P. Bigelow, Owosso.
2050	Samuel Bigelow, Sumner.
801	W. H. Bigelow, Corunna.
20	Arthur H. Bigg, Detroit.
1282	George J. Billing, Detroit.
2714	Frank C. Billings, Allegan.
1060	Charles A. Bird, Detroit.
330	Charles E. Bird, Saugatuck.
3579	Harry L. Bird, Detroit.
1743	Henry Bird jr., Douglas.
2008	Warren E. Birge, Kalamazoo.
3246	John D. Birney, Jackson.

CERT. NO.	NAME AND RESIDENCE.
3014	Chester Birns, Addison.
703	Augustus B. Bisbee, Benton Harbor.
2657	Henry M. Bishop, Cassopolis.
1472	Joseph M. Bittman, Saginaw.
3318	Byron D. Black, Bancroft.
2023	Josiah Black, Detroit.
2086	Howard A. Blackmar, Charlotte.
1055	Charles A. Blair, Morenci.
3609	Frank W. Blair, Birmingham.
175	C. M. W. Blakeslee, East Saginaw.
1356	Louis G. Blakeslee, Detroit.
154	Charles E. Blakley, Mancelona.
1277	Mary J. Blakely, Jones.
2586	Charles E. Bleakley, Detroit.
751	George G. Blakely, Fire Lake.
3319	George Edson Blodgett, Eaton Rapids.
1934	Jan Blok, Grand Rapids.
1935	Frank W. Bloomer, Novi.
3053	Ira Blossom, Big Rapids.
1479	Edward Blum, Detroit.
3247	Edwin T. Boden, West Bay City.
3200	Herbert F. Bodine, Clio.
1554	James H. Bogan, Mackinaw Island.
3107	D. R. Bogue, Detroit.
1368	Milo Bolender, Hubbardston.
2658	Edmund J. Bolio, Detroit.
3306	E. William Bolio, Detroit.
2651	Sarah A. Bolio, Detroit.
3320	Amos Bond, Fair Grove.
95	Ernest C. Bond, Muskegon
2784	Henry W. Booth, West Branch.
3652	Fred H. Borradaile, Detroit
3280	Charles H. Bostick jr, Manton.
668	John C. Bostick, Manton.
1324	Charles L. Bostwick, Watrousville.
2165	John T. Bostwick, Alpena.
567	Elton S. Botsford, Dorr.
2993	H. Elmer Botsford, Newaygo.
3047	Winifred O. Botsford, Dorr.
1604	Allen L. Bours, Detroit.
3248	Thomas W. Bowen, Emmett, Idaho.
799	James E. Bower, Crystal Lake.
432	Manly Bower, Clarkson.
3492	Reuben T. Bower, Petoskey.
1373	Henry D. Bowman, Almont.
3249	Samuel R. Boyce, Lawrence, Kan.
872	John H. Boylan, Detroit.
3410	Walter M. Boylan, Detroit.
3479	Oliver C. Boynton, Port Huron.
45	Frank E. Brackett, Cheboygan.
3108	Alexander J. Braden, Pine Creek.
3215	Cyrus F. Braden, Lakeview.
3168	George M. Braden, Scotts.
491	James C. Bradley, Camden.
3250	Frank J. Brainard, Eaton Rapids.
3043	Augustus W. Branch, Reading.
3032	Barbara Breden, Dryden.
2901	Richard Breden, Dryden.
3411	Alfred P. Breitenbach, Detroit.
3251	Reuben G Breningstall, Detroit.
2855	Chester E Bricker, Port Huron.
611	Charles T Briggs, Schoolcraft.
644	Joseph W Briggs, Schoolcraft.
3581	Perry Briggs, Ann Arbor.
592	Fred E. Bristol, Lapeer.
979	James Bristol, Ada.
548	Ulysses D. Bristol, Lapeer.
3412	Marion A. Britton, Pewamo.
2727	James C. Brooke Rapid River.
2609	Charles S. Brooks, Niles.
1843	Osro M. Brooks, Clifford.
1766	Charles M. Bross, Jerome.
2090	Amos Broughton, Manton.
2854	Albert Brower, Grand Rapids.
860	Albert E. Brown, Marquette.
3321	C. Kirby Brown, Saginaw.
880	Day Brown, Addison.
2014	Dennison B. Brown, Kalamazoo.
1617	George G. Brown, Kalamazoo.
2211	George W. Brown, Shiloh.
883	Henry J. Brown, Ann Arbor.

CERT. NO.	NAME AND RESIDENCE.
165	Henry L. Brown, Mason.
1801	Herman E. Brown, Stockbridge.
190	Isaac V. Brown, Galesburg.
440	Jeremiah J. Brown. Okemos.
2313	John G. Brown, Albion.
2116	Oscar D. Brown, Somerset Center.
3252	Robert C. Brown, Detroit.
879	William Brown, Addison.
679	William J. Brown, Detroit.
2253	William L. Brown, Prairieville.
2016	Gideon B. Browning, Decatur.
826	George N. Bruce, Evart.
2360	John G. Bruce, Burnside.
2802	William Brugma, Grand Rapids.
2068	Charles S. Brundage, Muskegon.
1441	Fred Brundage, Muskegon.
2164	Rudolph Bruske, East Saginaw.
3253	Charles H. Bryan, Detroit.
3167	James H. Bryen, Jackson.
885	B. F. Buchanan, Harrisville.
686	B. Stuart Buchanan, Detroit.
829	Joseph E. Buck, Vassar.
1465	Andrew J. Buckham, Flint.
1574	James L. Budge, Coleman.
2717	Charles A. Bugbee, Cheboygan.
850	Edwin A. Bullard, Vassar.
1649	Lucy A. Bullard, Berrien Springs.
1650	William L. Bullard, Berrien Springs.
1016	Otto Bullis, Maple Rapids.
2767	Julian W. Bullock, New Lothrop.
495	Sidney V. Bullock, Howard City.
842	Clifford S. Bundy, Bessemer.
2818	John A. Burch, Detroit.
1807	Andrew J. Burdick, Kalamazoo.
911	Henry H. Burdick, West Bay City.
1809	William A. Burdick, Galesburg.
3054	William H. Burke, Detroit.
3493	David H. Burley, Port Huron.
1242	Phillip F. Burn, Bay City.
1844	Ada L. Burnett, Red Jacket.
1289	Arthur W. Burnett, Lowell.
1734	Dewitt A. Burnett, Red Jacket.
1646	Samuel S. Burnett, Collins.
1223	James K. Burn, Linden.
1690	Charles S. Burrough, Clinton.
1048	George D. Burton, White Cloud.
224	Robert G. Burwell, Fort Gratiot.
1287	Levi W. Busby, Jonesville.
2949	Adelbert G. Bush, Clarksville.
2194	Charles T. Cadwell, Stanton.
1968	G. Frank Cady, Muskegon.
3413	Joel E. Cagwin, Boone, Iowa.
670	John C. Cahalan, Wyandotte.
647	Richard E. Cahalan, Wyandotte.
2258	John E. Cairns, Prairieville.
484	George G. Caldwell, Ann Arbor.
488	George W. Caldwell, Lyons.
1119	James W. Caldwell, Detroit.
1480	Eleazer E. Calkins, Ann Arbor.
3388	Alexander H. Cameron, North Lansing.
2740	John C. Cameron, Clio.
408	John R. Cameron, Sherman City.
3021	Reuben Cameron, Durand.
3582	Arthur Campbell, Crystal Falls.
2558	Edgar Campbell, Grand Rapids.
1517	George Campbell, Grand Ledge.
2420	H. Frank Campbell, Sherman.
1041	Henry T. Campbell, Grand Ledge.
1982	John E. Campbell, Detroit.
1981	Lewis W. Campbell, Grand Ledge.
1015	Marshall L. Campbell, Leslie.
2543	Mary Ann Campbell, Grand Rapids.
2710	Robert A. Campbell, Port Huron.
645	Edmund L. Carbine, Scotts.
1936	Chester Carey, Columbiaville.
599	Mary E. Carmen, Grandville.
3583	Joseph E. Carmody, Detroit.
445	Malcolm S. Carney, Decatur.
1071	Archibald D. Carpenter, N. Muskegon.
1340	Egbert Carpenter, Charlevoix.
2213	Lewis C. Carpenter, Bad Axe.
2637	Perley L. Carpenter, Copemish.
1310	F. W. Carr, Mt. Pleasant.
2648	Clorinda M. Carrel, Detroit.
2389	L. Jay Carrel, Detroit.
383	Hubert Carrier, Bay City.
152	Marcena A. Carroll, Ludington.
151	Watson Carroll, Ludington.
2212	Charles E. Case, Jonesville.
1957	Frank L. Cassey, Detroit.
2181	Chandler D. Caster, Springport.
1481	Arthur B. Casterlin, Lansing.
303	Frank D. Caulkins, Bay City.
2846	Harvey J. Chadwick, Hart.
1863	Elmer W. Chaffee, Plymouth.
676	Lorenzo Chambers, Maple Rapids.
696	Maria Chamberlain, Denver, Col.
1837	Fred J. Chamberlain, Battle Creek.
721	George T. Chamberlain, Hartford.
268	Merrick Chamberlain, Horton.
1166	William R. Champney, Detroit.
2280	Charles A. Chandler, Cambria.
1137	Arthur E. Chantler, Detroit.
1866	Silas D. Chapin, Salem.
3585	Fred Newton Chappel, Grand Blanc.
2544	Frank Chappell, Sand Lake.
3173	Fred E. Chappell, Grand Ledge.
3109	Alfred J. Chapple, Alba.
2255	Dell S. Chapple, Wayland.
126	Leander D. Chapple, Wayland.
1533	George L. Charles, St. Louis.
232	Eugene V. Chase, Elsie.
136	Henry H. Chatters, Flushing.
3610	Ward Nelson Choate, Jackson.
2254	William D. Choate, May.
257	John Christopher, Medina.
981	Albert S. Chubb, Pewamo.
3494	Kornelius S. Chudzinski, Bay City.
1446	Henry S. Church, Sturgis.
1613	Howard M. Church, Holly.
1333	Starr K. Church, Ann Arbor.
3539	William Charles Church, Detroit.
2521	William F. Church, Albion.
1375	Owen Churchill, Three Oaks.
2161	Sidney S. Claggett, Grayling.
1120	Charles H. Clapp, Oshtemo.
1393	Louis Grant Clapp, Mendon.
2444	Aaron Clark, Cannonsburg.
1161	Andrew G. Clark, White Cloud.
962	Arthur B. Clark, Gobleville.
781	Dwight H. Clark, Blissfield.
2990	Edgar A. Clark, Ionia.
81	Edward D. Clark, Hudson.
3244	Edward E. Clark, Battle Creek.
3039	George E. Clark, Detroit.
780	James K. Clark. Detroit.
3375	John Roland Clark, Grand Rapids.
3322	Loran C. Clark, Oxford.
27	Louis K. Clark, Oakley.
2899	Merton A. Clark, Grand Rapids.
1589	Sidney B. Clark, Flint.
3055	Thomas M. Clark, Port Huron.
3153	William F. Clark, Alpena.
1737	William M. Clark, Lowell.
2002	Edwin R. Clarke, Coldwater.
2000	Maurice G. Clarke, Coldwater.
2001	Ralph E. Clarke, Coldwater.
993	William G. Clarke, Detroit.
504	Henry Cleland, Detroit.
1514	Edward R. Close, Bellaire.
945	Orrin E. Close, Bellaire.
371	Albert B. Clough, Chesaning.
2709	Fred E. Clough, Alpena.
2705	William R. Clousten, Holton.
1350	Albert E. Cobb, Northville.
2105	George B. Cobb, Norvell.
2031	Henry W. Coburn, Schaffer.
2760	Fred A. Cochrane, Charlevoix.
1044	George W. Coe, Romeo.
523	Thomas D. Coe, Romeo.
380	John H. Coffman, Mackinac City.
3323	George Cohen, Detroit.

CERT. NO.	NAME AND RESIDENCE.
1881	Adolph Cohoe, Capac.
1880	Henry C. Cohoe, Capac.
82	Clarence J. Coleman, Dowagiac.
277	George E. Coleman, Elk Rapids.
2441	Howard G. Colman, Kalamazoo.
2895	A. Burton Collins, Charlotte.
3376	Clayton F. Collins, Monroe.
497	Edward M. Collins, Blissfield.
42	George V. Collins, Charlotte.
536	Horace M. Collins, Blissfield.
2061	John B. Collins, Frankfort.
1205	John F. Collins, Charlotte.
3414	William E. Collins, Bay City.
2610	Edward M. Colson, Alaska.
2649	Frank L. Colson, Alaska.
2587	Sherman T. Colson, Alaska.
3256	Samuel J. Colter, Detroit.
1398	Charles B. Colwell, Jackson.
1397	Frederick M. Colwell, Jackson.
1819	Llewellyn A. Colwell, Harrisville.
1961	Richard P. Comfort, Nashville.
2160	Emmet J. Condra, Quincy.
2950	J. Layton Congdon, Kalamazoo.
2967	Alfred Conklin, Carson City.
1923	Joseph Conkling, Keelerville.
3324	William B. Conley, Whitehall,
3584	Harry J. Connell, Belding.
939	Dewitt Connine, Wexford.
1136	George M. Connor, Detroit.
442	James W. Connor, Detroit.
2780	John T. Conrad, Otsego.
3255	William A. Converse, Morenci.
1536	Ventry R. Conway, Sault Ste Marie.
1331	Alice A. Cook, Bay City.
182	Charles E. Cook, Bay City.
1191	Charles H. Cook, Burlington.
3495	Charles W. Cook, Grand Rapids.
377	Dell W. Cook, Fulton.
1095	George S Cook, Brooklyn.
2707	James M. Cook, Muskegon.
2054	Lester M. Cook, Fenton.
1158	Mandana G. Cook, Albion.
299	Omar G. Cook, Fulton.
2053	Wilford P. Cook, Fenton.
3415	Albert S. Cooke, Toronto, Ont.
1938	Frederick A. Cooke, Detroit.
1401	Cyras D. Cooley, Woodbury.
708	E. C. Cooley, Ishpeming.
1296	Aaron W. Cooper, Fowlerville.
2442	Isaac S. Cooper, Cheboygan.
2244	May I Coppernoll, Port Sanilac.
2070	George T. Coppernall, Port Sanilac.
2344	Ellsworth C. Corbett, Jonesville.
2951	Eliphalet A. Cornell, Thedford, Ont.
3210	Griffith Cornell, Thedford, Ont.
2843	Wilmot P. Cotton, Macon.
971	C. Fred Covert, Ovid.
2333	Charles R. Cox, Detroit.
2314	William G. Cox, Detroit.
40	William W. Cox, Mt. Pleasant.
368	Robert C. Coy, Chicago, Ill.
1950	Charles B. Crampton, Flint.
2417	Ambrose W. Crane, Hillsdale.
2443	Evelyn D Crane, St. Joseph.
2156	George R. Crane, Chicago, Ill.
1525	George W. Crane, Cheboygan.
1692	Marvin Crane, Lake Odessa.
595	Wallace D. Crane, Portland.
1237	Cornelius Crawford, Grand Rapids.
167	James B. Crawford, Ithaca.
1268	Mary E. Crawford, Milford.
1423	Perry L. Crawford, Oakesdale, Washt'n.
1260	Walter Crawford, Milford.
3377	Clarence H. Crego, Hamilton, N. Y.
1937	Edward A. Cress, Minden City.
2421	Irving L. Cressy, Hastings.
2725	John Crispe, Plainwell.
593	Elmer U. Crittenden, Waldron.
1313	Charles M. Crofoot, Pontiac.
3056	Jerry Croley, Saginaw.
2801	Joseph W. Croman, Detroit.

CERT. NO.	NAME AND RESIDENCE.
3025	Carrie E. Cross, Grand Rapids.
756	Fred E. Cross, Grand Rapids.
1632	Lyman S. Crotser, Edmore.
985	George W. Crouter, Charlevoix.
3258	Charles M. Crowe, Detroit.
3257	Charles F. Crowley, Detroit.
1719	Delphine M. Crowley, Detroit.
1711	John J. Crowley, Detroit.
2492	John J. Crowley, Marquette.
2439	Daniel F. Culver, Hillsdale.
3158	Fred W. Culver, Grayling.
218	George T. Culver, Coldwater.
3231	Lorenzo J. Culver, Adrian.
2794	Richard W. Culver, South Haven.
229	Robert J. Cummer, Cleveland, O.
3057	Martin V. Cuncanan, Grand Rapids.
3496	Andrew R. Cunningham, Detroit.
1483	William Curlett, Dexter.
3046	Lizzie Curlette, Dexter.
964	Edward S. Curran, St. Joseph,
791	Andrew A. Currie, St. Clair.
269	Clarence A. Curtis, Petoskey.
709	Frank E. Curtis, Napoleon.
1027	Frank W. Curtis, Grand Rapids.
3020	James B F. Curtis, Corunna.
421	John N. Curtis, Vandalia.
2166	Ray D. Curtiss, Woodville.
2745	Henry D. Cushman, Three Rivers.
658	William R. Cutler, Ionia.
3325	Charles E. Dale, Evart.
2126	John A. Damon, Millington.
1232	Philo L. Daniels, Lansing.
1886	Ephafro R. d. Arcambah, Kalamazoo.
16 2	George S. Darling, Tawas City.
2087	Walter G Daugherty, Coldwater.
2979	Robert P. Davey, Colorado Springs, Col.
3553	A. Clement Davis, Grand Ledge.
954	Cyrus G. Davis, Milford.
3182	Fennimore C. Davis, Sand Beach.
1921	Fred S. Davis, Ypsilanti.
1870	George L. Davis, Lansing.
3259	George R. Davis, Hillsdale.
564	John W. Davis, Fenton.
179	Malcolm D. Davis, Clare.
2148	Orea L. Davis, Cadillac.
2611	Robert W. Davis, Milwaukee.
1254	Thomas W. Davis, Detroit.
1267	Warren E. Davis, Grand Ledge.
3326	Charles Albert Day, Kalamazoo.
2953	Herbert L. Day, Columbiaville.
3416	John N. Day jr., Ashley.
279	Levi Day, Pierson.
3497	Walter Leslie Day, Detroit.
780	A. J. Dayton, Grand Rapids.
2536	John S. Deady, Croswell.
2522	William H. Deady, Bad Axe.
1669	Albert B. Dean, Freesoil.
1541	Henry M. Dean, Niles.
3058	Henry M. Dean jr., Niles.
153	Orrin S. Dean, Freesoil.
1549	C. Cass De Armand, Dayton.
1891	Erastus H. Deatsman, Sunfield.
584	John De Boe, Grand Rapids.
3327	Herbert E. Decker, Manistee.
2819	Matthew E. Dederich, Detroit.
1364	John H. De Hart, Vernon.
1365	Frank De Hart, Vernon.
2047	Levi De Haven, Bangor.
248	Anthony De Kruif, Zeeland.
309	James De Kruif, Grand Rapids.
2721	Milton L. De Land, South Saginaw.
886	Benjamin L. De Lisle, Clarkston.
55	John T. Delzell, Bay City, West.
3417	David J. De May, Jackson.
1708	William M. Demerest Webberville.
2755	Clyde S. Demorest, Chicago, Ill.
118	William H. Dendel, Hopkins Station.
1969	Edward A. Dennis, Rochester.
2445	George C. Dennis, Rochester.
3378	Myrt M. Dennison, Muskegon.
1066	Solomon W. Denton, Pontiac.

CERT. NO.	NAME AND RESIDENCE.
41	Casper E. DePuy, Stockbridge.
589	Alderic Deschamps, Chassell.
1955	F. Horace Desjardins, Marquette.
884	Edward C. Des Rochers, Houghton.
1670	Hubert Deuster, Suttons Bay.
1832	J. H. B. Deuster, Suttons Bay.
1664	John Deuster, Suttons Bay.
625	Nilke De Vries, Grand Rapids.
982	Charles C. Dewey, Napoleon.
1636	Fred E. Dewey, Kingston.
202	George S. Dewey, Jackson.
919	Lila Dewey, Napoleon.
601	Peter A. Dewitt, Spring Lake.
3159	John J. Dexter, Bellevue.
3418	Jay W. Diamond, Grand Rapids.
260	Otis B. Dickinson, Grand Rapids.
2315	George A. Dillenbach, Cadillac.
3022	Charles J. Dilley, Portland.
3208	James E. Dillon, East Tawas.
236	Stowell H. Dimmick, Ypsilanti.
884	George W. Dimond, Tuscola.
3012	John W. Doan, Flint.
127	Cadalzo A. Dockstader, Three Rivers.
1436	Erasmus S. Dodd, Buchanan.
1435	I. LeRoy H. Dodd, Buchanan.
1011	Edward L. Dodge, Montague.
1610	Harry R. Doesburg, Holland.
1622	Jacob O. Doesburg, Holland.
2905	William A. Dohany, Detroit.
3538	Harry Dolson, Detroit.
2954	William Donaghy, Alpena.
642	Cornelius Donahue, Clio.
657	Thomas Donlop, South Lyons.
3133	John O. Donoghue, Negaunee.
3419	Charles Dornan, Elkton.
3111	Frank W. Dorr, Detroit.
209	Albert A. Dorrance, Coldwater.
210	Albert J. Dorrance, Coldwater.
3112	Victor L. Dorrance, Owosso.
2811	Jephtha W. Doty, Detroit.
2812	Wirt P. Doty, Detroit.
3420	Matthew H. Douglas, Detroit.
3498	James N. Downey, Detroit.
3611	George E. Doyle, Detroit.
1680	Augustus C. Drake, Battle Creek.
3328	Clyde I. Drake, Negaunee.
187	William T. Drake, Marshall.
1392	James H. Dresser, Brooklyn.
2820	Frank W. Droelle, Detroit.
3534	Adolph E. Dryer, Ann Arbor.
161	Frank Dullam, Flint.
1515	John C. Dullam, Flint.
2797	William Dullam, Flint.
3059	Dan. L. Dumon, Evart.
1568	Rensselaer H. Dunbar, Parma.
1560	Winfield L. Dunbar, Parma.
3329	Harold James Duncan, Toledo, Ohio.
2010	Levi A. Dunlap, Vermontville.
3535	Alexander Francis Dunlop, Alpena.
1448	James A. Dunlop, Fenton.
1802	John W. Dunlop, Clare.
2009	William A. Dunlop, Lawton.
1014	Harlan P. Dunning, Allegan.
1668	Oscar B. Dunning, Vicksburg.
1608	Richard S. Dupont, Detroit.
3421	Walter S. Dupont, Detroit.
6	William Dupont, Detroit.
2951	John Durst, Lansing.
280	John C. Dutmers, Grand Rapids.
3209	Cornelius Dykema, Grand Rapids.
3379	Frank G. Easterday, Jackson.
2817	Louis K. Eastman, Detroit.
1939	Charles L. Eaton, Paw Paw.
1635	Edwin Eaton, Hudson.
1629	Henry H Eaton, Boyne Falls.
1305	Orletus P. Eaton, Detroit.
3422	Roy R. Eaton, Lowell.
1181	Christian Eberbach, Ann Arbor.
1180	Ottmar Eberbach, Ann Arbor.
2925	Ottmar Eberbach, Ann Arbor.
3116	William F. Eberbach, Ann Arbor.
986	Alexander H. A. Eckerman, Muskegon.
235	Andrew A. Eddy, Augusta.
699	Fred J. Ellenburg, Fowler.
841	Willis M. Elder, Lansing.
918	Burt C. Eldred, Chesaning.
988	Joseph N. Eldred, Chesaning.
598	Mirtille M. Eldridge, Sioux City, Iowa.
3330	Henry Elfbrandt, Negaunee.
3210	Daniel W. Elferdink, Grand Rapids.
3499	Andrew H. Elliott, Elmira.
252	Richard H. Elliot, Pontiac.
3010	Charles Ellis, South Lyon.
2994	Charles A. Ellis, Pierport.
2993	Leroy A. Ellis, Van Wert, Ohio.
3612	Thomas Russell Ellis, Port Huron.
3114	Albert Ellsworth jr, Escanaba.
3480	Arthur T. Ellsworth, Hancock.
3115	William H. Elston, Marshall.
3260	Julia E. Emanuel, Antwerp, Ohio.
3381	Fred H. Emery, Charlotte.
2132	Horatio J. Emery, Charlotte.
2647	William L. Emmerson, Olivet.
990	Marvin C. Empey, South Bay City.
3029	Manlius A. Engle, Big Rapids.
1224	Washington A. Engle, Hartford.
1893	Hiram G. Ensley, Stevensville.
2924	George W. Eoff, Detroit.
2724	James Erskine, Rogers City.
1823	Lizzie Erskine, Rogers City.
2128	Andrew J. Ervey, Wheeler.
3382	Fred J. Erwin, Marlette.
718	Matt J. Erwin, Harbor Springs.
3586	Sidney A. Erwin, Leslie.
1831	Frank H. Escott, Grand Rapids.
2656	Peter M. Etchell, Jackson.
2524	Ephraim B. Evans, Farwell.
2732	Jennie E. Evans, Mecosta.
3184	Maggie Evans, Detroit.
2841	Walter S. Evarts, Detroit.
2645	Charles Everhart, Lansing.
1484	Herbert E. Ewell, Rochester.
778	Charles E. Ewers, Union City.
1302	Thomas S. Ewing, Reading.
2074	Ward B. Falk, Deer Lake.
3117	Orrin A. Fanckboner, Grand Rapids.
2215	Edward Farnham, Casnovia.
1300	Arphax Farnsworth, East Saginaw.
1359	Louis J. Fasquelle, Petoskey.
1198	Charles A. Fatin, Almont.
2560	Orion J Fay, Carleton.
734	Irving W. Feighner, Muskegon.
610	Henry J. Felig jr., Wyandotte.
2285	Clarence A. Fellows, Three Rivers.
2361	Clinton H. Felt, Constantine.
3219	George H. Felt, Grand Rapids.
2109	Henry H. Fenn, Chelsea.
3330	J. Harvey Fenner, Romeo.
1995	Charity S. Fenton, Bailey.
3554	George C. Fenton, Bailey.
2390	George L. Fenton, Kingsley.
1283	Frank Ferguson, Coldwater.
578	George Ferguson, Coldwater.
1379	John P. Ferguson, Middleville.
3261	Neil E. Ferguson, Kansas City, Kan.
3185	Clarence H. Ferris, Detroit.
2195	Charles L. Fichtel, Hancock.
590	Rhino Fichtel, Hancock.
2290	Frank H. Field, Dansville.
558	James E. Field, Alpena.
1771	Margaret Fiero, Detroit.
365	Wright E. Fiero, Detroit.
332	Alfred S. Fildew, St. Johns.
3856	Paul V. Finch, Grand Rapids.
3	Francis W. Fincher, Pentwater.
460	Charles C. Findley, Centreville.
2718	Leon C. Fink, Detroit.
1712	Bell R. Finlayson, Detroit.
3331	Denton Rose Finlayson, Detroit.
1361	J. Maurice Finn, Highland Park.
319	Louis E. Finn, Cadillac.
2995	Matthew Finn jr., Detroit.

CERT. NO.	NAME AND RESIDENCE.
3199	Edward Finnegan, Escanaba.
2795	John Finnegan, Escanaba.
2362	Annie E. Fish, Watrousville.
3118	Charles A. Fisher, Detroit.
3332	George W. Fisher, Grand Rapids.
1570	Haye J. Fisher, Hamilton.
215	Herbert A. Fisher, Lake City.
1121	James Fisher, Marlette.
1126	Charles A. E. Fisk, Petoskey.
3555	Frank M. Fisk, Edwardsburg.
903	Porter B. Fitzgerald, Benton Harbor.
3536	Arthur Berthold Fleischer, Saginaw.
3262	Merrill S. Flint, Brentwood, N. Y.
527	Wakeman C. Fluke, Clayton.
3087	Pat Fogarty, Stambough.
3613	Bion E. Foley, Lakeview.
2155	Edward W. Follett, Sturgis.
3119	George W. Foot, Charlotte.
702	William H. Foot, East Saginaw.
2231	Charles E. Foote, Jackson.
3268	James A. Forbes, Detroit.
1485	Robert S. Forbes, Detroit.
3500	Theron Forbes, Middleville.
1086	Maitland M. Fordham, Elmira.
771	Watson W. Fordham, Traverse City.
1900	George W. Forrest, Fennville.
1676	Will W. Forrest, Rockford.
600	John E. Forster, Mt. Clemens.
3333	Edward L. Forsyth, Detroit.
3221	Richard S. Forsyth, Detroit.
3334	Albert A. Foster, Benton Harbor.
2666	James Foster, Peck.
690	Washington Foster, Gaines.
475	Achilles Fournier, Detroit
768	Lucien Fournier, Grayling.
689	De Clifford Fox, Detroit.
3501	Frederick Fox, Kingston.
3120	Ira K. Fox, Manistee.
18	John B. Fox, Cedar Springs.
3174	Augustus W. Foy, Ludington.
541	Charles H. Frain, Laingsburg.
2119	Henry A. Frank, Detroit.
1381	Saul Frank, Kendall.
500	William Frankish, Centreville.
3335	Charles H. Frantz, East Saginaw.
3061	William Fraser, Detroit.
1043	Frank H. Frazee, Batmore.
1433	James Frazer, Muskegon.
3587	Louis S. Freeman, Chelsea.
1774	Lewis Freer, Vandalia.
106	Charles S. French, Hillsdale.
1941	Engelbert Frenz, East Saginaw.
2807	Gustavus S. Frenzel, Mayville.
2498	N. Emeline Frizelle, Detroit.
316	Seymour F. Frizelle, Detroit.
3223	Perry L. Fritz, Cass City.
302	Theodore H Fritz, Cass City.
3226	Henry J. Frost, Saginaw.
3423	Calvin Fuhrman, Muskegon.
3048	Andrew F. Fuller, North Adams.
1887	Fred R. Fuller, Newberry.
2287	Frederick W. Fuller, Swartz Creek.
2857	James C. Fuller, Ypsilanti.
1875	Rinaldo Fuller, Manton.
1486	Lewis J. Fulmer, Detroit
2434	Marianne Fulton, Detroit.
1916	Robert Fulton, Detroit.
3363	William H. Fulton, Akron.
2260	C. Brousais Fuqua, Big Rapids.
2450	Allen M. Gage, Oxford.
3389	George L. Gage, Menominee.
783	Henry H. Gage, Olivet.
2773	Daniel J. Gahan, Mt. Pleasant.
449	Joseph M. Galge, Crosswell.
3264	Bert A. Gale, Albion.
1290	John L. Gale, Plymouth.
3424	Edward W. Gallagher Saginaw.
1425	Patrick H. Gallagher, Hancock.
1942	Benjamin O. Gallup, Marshall.
291	Amos J. Gambell, Medina.
2858	William P. Gamber, Stanton.
1971	William R. Gannon, Hartland.
1487	John N. Gardiner, Lapeer.
1970	Austin R. Gardner, Fowlerville.
2092	Frank L. Gardner, Lansing.
1831	James R. Gardner, Rose Centre.
193	John T. Gardner, Lake City.
1488	Llewellyn H. Gardner, Detroit.
2232	J. P. Garieny, Bay City.
3588	Edward J. Garner, Mackinac Island.
228	William L. Garrett, Watervliet.
111	William J. Garrod, Allegan.
2384	Stephen A. Gates, Crystal.
932	Theodore O. Gates, East Tawas.
2835	Edward M. Gay, Manistee.
889	Samuel M. Geary, Maple Hill.
1261	Carlisle D. Geer, Linden.
1190	Anton Gehrman, Frankenmuth.
3265	August A. Geiseler, Detroit.
3063	Allen J. Genny, East Saginaw.
2355	Henry George, Detroit.
212	William O. George, Marcellus.
157	J. Henry Gerles, Big Rapids.
1109	Thomas W. Gerles, Big Rapids.
130	John E. Gerow, Ovid.
76	Martha D. Gerow, Ovid.
290	Charles N. Ghent, Bay City.
2668	John R. Ghent, Muskegon.
1142	Franc M. C. Gibb, Copernish.
1672	John A Gibb, Kalamazoo.
2956	H. M. R. Gibbs, Howard City.
759	Northrup C. Gibbs, Big Rapids.
2246	Andrew B. Gibson, Grand Rapids.
1250	Worden S. Gibson, Crosswell.
1557	Charles M. Giddings, Jackson.
3502	Albert J. Gies, Detroit.
2852	Howard E. Gill, Northport.
2877	William Gill, Northport.
2494	William J. Gill, Ironwood.
2298	Joseph D. Gilles, Pompeii.
3383	Sidney E. Gillett, Muskegon.
1013	Plimmon Gilman, Hudson.
29	Chester W Gilson, Coloma.
1245	H. E. Grand Girard, Grand Rapids.
518	Benjamin O. Gladding, Constantine.
2392	Herbert L. Gladwin, Merrill.
1087	Alexander Glasgow, Port Huron.
183	Frank P. Glazier, Chelsea.
1538	George P. Glazier, Chelsea.
182	Elmer G. Gleason, Richmond.
1984	Charles N. Glover, East Lake.
1409	Loui B. Glover, Muskegon.
2821	Edward Goddeyne, Detroit.
1236	Frank W. Godding, Onondaga.
747	William Godley, Escanaba.
1449	Louis Goecken, East Saginaw.
3503	Ernest W. Goff, Tecumseh.
2167	Charlie L. Gol ', Burlington.
3614	Elizabeth Golden, Fenton.
3556	Enos Golden, Fenton.
1785	Peter C. Goldschmidt, Suttons Bay.
379	George S. Goldsmith, Manistee.
2957	Hermann C. Goldsmith, Manistee.
2233	Henry A. Goodale, East Tawas.
784	Henry B. Goodale, East Tawas.
3336	Martin H. Goodale, Battle Creek.
573	Clyde Goodrich, Marcellus.
2822	George B. Goodrich, Detroit.
1028	Lester A. Goodrich, Hillsdale.
522	Lucius C. Goodrich, Kalkaska.
2561	Orris C. Goodrich, Kalkaska.
556	Arthur A. Goodsell, Jasper.
3557	Andrew J. Goodwin, Detroit.
3564	Charles E. Goodwin, Nashville.
882	Emma Goodwin, Detroit.
3425	Newland A. Goodwin, Detroit.
3026	Scarboro H. Goodwin, Detroit.
1790	J. J. Goodyear, Ann Arbor.
10	William H. Goodyear, Hastings
3266	Frank W. Gordon, Detroit.
606	Charles H. Gorsuch, Waldron.
2911	Otis Gould, Henderson.

CERT. NO.	NAME AND RESIDENCE.
1581	George H. Gover, Leaton.
1775	Arthur F. Gowman, Detroit.
717	Corydon P. Gowman, Detroit.
469	Alvin B. Graham, Croswell.
3205	Charles R. Graham, Grand Rapids.
2436	Frank W. Graham, Ludington.
2859	John N. Graham, Prescott, Ont.
425	Hamon Gramkie, Petersburg.
3426	Carl Granacher, Detroit.
476	Algernon S. Grandy, Fairfield.
446	Francis Grandy, Fairfield.
1306	George L. Granger, Mt. Pleasant.
2097	Henry J. Graves, Indian River.
1988	Herbert G. Graves, Indian River.
1925	Samuel E. Graves, Adrian.
2196	Clark M. Gray, Hudson.
575	George H. Gray, Alpena.
2823	John W. Gray, Detroit.
3384	Moses A. Graybiel, Port Huron.
3615	William Sherman Gregg, Detroit.
1342	Henry E Green, Olivet.
2860	Charles H. Greene, Detroit.
186	George H. Greene, Marshall.
923	Julius L. Greenthal, Detroit.
3427	Pliny M. Grice, Allegan.
3064	Talbot Gridley, Grand Rapids.
2290	Edwin C. Griffin, Niles.
2908	John A. Griffin, St. Charles.
1489	William F. Griffith, Howell.
2451	H. Dwight Griswold, Sherman.
1800	William Grossman, Saginaw.
623	Arthur N. Grovier, Mt. Clemens.
613	Edwin H. Grovier, Mt. Clemens.
322	Oliver H. Grunow, Detroit.
1219	Edmund Gudchinsky, Kalamazoo.
3428	C. A. Guebelle, Detroit.
1776	Fred. Guentherodt, Detroit.
2925	Harry C. Guillot, Windsor, Ont.
2862	George Gundrum, Ionia.
1323	Godfrey Gundrum, Le Roy.
2364	George Gundry, Grand Blanc.
2346	Ambrose F. Gunsolus, Petersburg.
1640	Charles Gunsolus, Petersburg.
288	Charles B. Gurney, Omaha, Neb.
1778	James N. Gustin, Detroit.
692	Gilbert T. Haan, Grand Rapids.
2816	Jacob J. Haarer, Detroit.
452	Philo E. Hackett, Wolverine.
3190	John G. Hackney, Detroit.
1218	Sarah E. Hadden, Marine City.
1225	Silas W. Hadden, Marine City.
2762	Ernest C. Haefner, Sioux City, Iowa.
119	George J. Haeussler, Manchester.
3607	Adolph Hafeurreffer, Bessemer.
1546	Daniel A. Hagans, Monroe.
1547	William Hagans, Monroe.
712	Allen F. Hagedorn, West Bay City.
1599	John S. Haggart, Owosso.
671	Henry Haigh, Detroit.
2868	Arthur L. Haight, Sand Lake.
296	Charles F. Haight, Owosso.
246	Charles W. Hale, Perrinton.
120	Harry G. Hale, Nashville.
1910	Wallace A. Hale, Ashley.
192	Daniel T. Hall, Tecumseh.
3187	George C. Hall, Detroit.
3338	Gilbert Powrie Hall, Windsor, Ont.
2185	Henry Hall, Three Rivers.
395	John W. Hall, Ann Arbor.
2736	Perley W. Hall, Benton Harbor.
1405	William A. Hall, Greenville.
3337	William R. Hall, Manistee.
2864	Eustache B. Halliday, Detroit.
2712	Olliver L. Halliday, Mulliken.
748	Dayton S. Hallock, Detroit.
2865	Louis H. Hallock, Sebewaing.
2894	Lineas I. Halsey, Tawas City.
1165	A. O. Halstead, Grand Ledge.
1173	Andrew J. Halstead, Grand Ledge.
576	Elizabeth W. Halstead, Mason.
1786	Henry P. Halstead, Morrice.
547	Oliver W. Halstead, Mason.
1092	Richard H. Halstead, Concord.
2588	C. Will Hamilton, St. Charles.
422	Edward A. Hamilton, White Pigeon.
1707	Harry G. Hamilton, East Saginaw.
3267	Jerome D. Hamilton, Paw Paw.
2545	John R. Hamilton, Fair Grove.
1841	Richard J. Hamilton, Detroit.
2293	David Hammell, New Baltimore.
746	Horace H. Hammond, Luther.
3429	Theron W. Hammond, Hillsdale.
2926	Slocum Hance, Detroit.
1475	James L. Handy, Boyne City.
3268	Frank L. Hankinson, Detroit.
3430	John H. Hanley, Strathroy, Ont.
240	Amos Hanlon, Middleville.
758	Edward O. Hanlon, Middleville.
242	Homer B. Hanlon, Middleville.
1948	Martin Hanlon, Williamston.
482	William F. Hansen, Lansing.
486	George M. Hard, Clinton.
473	George P. Harmon, Mackinaw City.
2262	Alice F. Harper, Milan.
2261	Eliza B. Harper, Milan.
2120	John C. Harper, Milan.
1368	Augustus J. Harris, Essexville.
862	Charles W. Harris, Moscow.
2454	Daniel H. Harris, Shelbyville.
3162	G. Burton Harris, Lansing.
1798	George E. Harris, Grant Village.
2184	John M. Harris, Boyne City.
2983	Levi A. Harris, Vanderbilt.
1407	Louisa T. Harris, Essexville.
3155	Stephen T. Harris, Houghton.
3585	Charles Harrison, Ann Arbor.
2770	George W. Harrison, Lansing.
602	Horace E. Harrison, Vassar.
3065	Ira W. Harrison, Gananoque, Ont.
2183	Thaddeus R. Harrison, Paw Paw.
3339	Austin P. Hart, Mulliken.
935	Samuel E. Hart, Adrian.
2866	William S. Hart, Lake Odessa.
2834	E. C. LaFord Harvey, Rodney, Ont.
1539	Henry D. Harvey, Bangor.
28	John Harvey, Detroit.
1490	Samuel K. Harvey, Windsor, Ont.
1682	Thomas Harvey, Carsonville.
264	Guy M. Harwood, Petoskey.
454	Henry Harwood, Ishpeming.
1778	Charles H. Haskin, Jackson.
1170	Emma K. Haskin, Jackson.
513	Rodney A. Hastings, Sparta.
1891	Henry B. Hatch, Hart.
1462	Maitland W. Hatch, Marshall.
3431	George S. Hawes, Saginaw.
758	Alice F. Hawkins, Cedar Springs.
1874	Arthur H. Hawkins, Clayton.
506	Edwin R. Hawkins, Clayton.
448	Henry E. Hawkins, Wayland.
807	Elva D. Hawley, Stanton.
1258	Louisa I. Hawley, Fitchburg.
3558	Frank L. Hayes, Detroit.
2495	George A. Haymes, Homer.
3031	John B. Haynes, Dundee.
2756	Robert W. Hazletine, Grand Rapids.
1212	Frank Heacox, Nashville.
2907	Hannibal M. Heal, Clinton.
900	Fred. Heath, Hastings.
3269	Rolla M. Heath Chicago, Ill.
1635	George S. Hebert, South Lake Linden.
2066	Hiram C. Hedges, Lansing.
1329	Thomas Heffernan, Baldwin.
2291	Henry Heim, Saginaw.
2292	William Heim, Saginaw.
1414	Daniel Heims, Davison.
519	Sylvester J. Heimbach, Constantine.
457	John Heimer, Battle Creek.
180	Sylvanus Hemans, South Lyons.
631	Charles P. Hempstead, Bay City.
1455	Frank L. Henderson, Jackson.
3183	John M. Henderson, Owosso.

CERT. NO.	NAME AND RESIDENCE.
2098	Fred. H. Hendrick, Stanton.
1049	Wells W. Hendricks, Crystal Falls.
48	Henry Heneka, Grand Rapids.
3537	William F. Henes, Bay City.
2892	Florence H. Henning, Detroit.
2848	Fred. J. Henning, Detroit.
3271	Leonard Hermenau, Detroit.
3559	Archie W. Herrick, West Bay City.
1890	Jeremiah J. Herrick, Crystal.
3504	Mae Herriman, Cadillac.
1010	Addison M. Herrington, Freeport.
3616	Henry A. Herzer, East Saginaw.
639	Byron E. Hess, Clarksville.
3007	Frank P. Hess, Detroit.
2927	George J. Hess, Chicago, Ill.
3505	Charles C. Hessey, Grand Rapids.
286	Wesley F. Hessler, Rockford.
1859	William Hessler, Middleville.
2769	Emil G. Heumann, Ironwood.
853	John S. Hewitt, Milford.
1238	L. Eugene Hewett, Lansing.
1926	William Heysett, Ludington.
1025	Frank Hibbard, Menominee.
3340	John C. Hickey, Highland Park.
3538	Charles F. Hicks, Pontiac.
886	Charles V. Hicks, Oscoda.
145	William H. Hicks, Morley.
1991	William L. Hicks, St. Johns.
3172	Henry C Hiftline, Adrian.
1644	Frank S. Hillhouse, Kalamazoo.
2977	Burwell Hinchman, Sawyer.
2976	Frank B. Hinchman, Sawyer.
441	Elisha J. Hinds, Midland.
867	Franklin G. Hines, Charlevoix.
2108	Thomas Hines, Coopersville.
3386	Lowell Hinman, Sparta.
2824	Paul H. Hirth, Detroit.
1156	Henry C. Hisner, Detroit.
416	Herbert A. Hitchcock, Detroit.
1065	Willis A. Hitchcock, Manistee.
2615	Fred. Hock, Jr., Adrian.
3481	Benjamin H. Hocking, Iron Mountain.
3482	Joseph F. Hocking, Crystal Falls.
825	Frank A. Hodges, Parma.
362	Herrick Hodges, South Haven.
1442	John A. Hoedemaker, Grand Rapids.
3272	Sigmund M. Hoeger, Detroit.
2898	Harry H. Hoffman, Jackson.
3506	John W. Hoffman, Detroit.
999	John G. Hogeboom, Saginaw.
184	Fred'k F. W. Hogguer, Detroit.
1756	James L. Hogle, Farmington.
3482	Louis T. W. Hogrefe, Kalamazoo.
2989	Arthur W. Holsington, Gaines.
2146	Arthur G. Holbrook, Coldwater.
1730	Frederick A. Holbrook, Hubbardston.
3433	Grant G. Holden, Yale.
2978	Hiram W. Holden, Portland, Ore.
655	Jesse F. Holden, Brown City.
91	Thomas F. Holden, Imlay City.
554	Marion Holland, Edwardsburg.
3483	Calvin C. G. Hollinger, Sault Ste. Marie.
3434	Charles W. Hollis, Manchester.
2121	Charles E. Hollister, Detroit.
3068	George S. Hollister, Benton Harbor.
750	Lucius L. Holloway, Kalamazoo.
749	William J. Holloway, Hastings.
2589	David Holm, Kings Mills.
660	Adolphus G. Holmes, Vernon.
32	Alonzo O. Holmes, St. Johns.
3067	Frank M. Holmes, Sparta.
980	Louis F. Holmes, Belding.
1883	Theodore S. Holmes, Lansing.
2118	Alvin E. Holt, Detroit.
2614	Nelson D. Holt, Hesperia.
2088	Samuel H. Holton, Battle Creek.
1012	C. Theodore Holz, Richville.
3941	Robert B. Honey, Dexter.
3273	Robert H. Honner, Detroit.
1207	Andrew Hood, Detroit.
1089	Willis F. Hood, Detroit.
3211	Marius D. Hoogesteger, Grand Rapids.
618	Patrick H. Hoonan, Reed City.
166	Fred S. Hopkins, Benton Harbor.
586	Irving F. Hopkins, Muskegon.
594	Arthur G. Hopper, Alpena.
3069	Orion S. Hopperstead, Detroit.
1578	George P. Hoppough, Smyrna.
2452	David A. Horner, Caro.
483	Charles B Hoskins, Butte, Montana.
1698	Charles W. Hotchin, White Pigeon.
1687	Fred C. Hotchin, White Pigeon.
1791	Frederick Hotchkiss, Hastings.
3123	George D. Hough, Ironwood.
2453	Charles H. Houghtaling, Quincy.
2455	Calvin E. Houk, Ironwood.
3040	Harry S. Houk, Detroit.
1197	Frank Houp, Detroit.
110	Alfred B. House, Memphis.
2771	Edwin M. Hovey, Fenton.
2910	Brooks W. Howard, Croswell.
674	Charles Howard, Birmingham.
507	Clarence A. Howard, Clayton.
477	Ida Howard, Dowagiac.
429	William S. Howard, St. Joseph.
2422	Willis M. Howard, Litchfield.
1703	Samuel Howarth, McMinnville, Ore.
418	Chauncey F. Howe, Beaver Lake.
2393	George B. Howe, North Star.
2959	Harry B. Howell, Galt, Ont.
1201	Eliza A. Hower, Mendon.
569	Nelson Hower, Mendon.
1020	Byron A. Hoxie, Grand Rapids.
1491	Charles B. Hoyt, Detroit.
3177	Jesse B. Hoyt, Grand Rapids.
3342	Marcus Hoyt, Mio.
253	Charles W. Hubbard, Davisburg.
2613	Frank J. Hubbard, Battle Creek.
294	Grace Hubbard, Davisburg.
3589	John L. Hubbard, Waterloo.
1256	Theron T. Hubbard, East Saginaw.
535	William H. Hubbert, Union City.
3435	William R. Hubert, Detroit.
3436	John H. Hubbard, Saginaw.
1849	Frank O. Hudnutt, Lansing.
1850	Charles H. Hudson, Marcellus.
459	Frederick Hudson, Riverdale.
2590	Samuel Hudson, New Haven.
2790	Charles Hueber, Port Huron.
3070	George C. Hueston, Northville.
493	Ella R. Huffard, Allen.
3274	Theodore Hug, Detroit.
1410	Albert J. Huizinga, Holland.
1330	Charles W. Hull, Bay City.
1521	Ella A. Hull, Maple Ridge.
1930	Frank D. Hull, Vermontville.
2669	Thomas A. Hull, Maple Ridge.
767	Frederick Humburg, Detroit.
1611	Bishop Humiston, Jackson.
809	Charles E. Humphrey, Nashville, Tenn.
3590	Curtis E. Humphrey, Holly.
434	Edward C. Humphrey, West Branch.
3124	Horace E. Hungerford, Mio.
3071	Dewitt H. Hunt, St. Johns.
511	George E. Hunt, Flint.
1544	Leonard H Hunt, Lowell.
2783	William E. Hunt, Marine City.
1545	Arvin P. Hunter, Lowell.
2566	David M. Hunter, Burt.
1788	Augustus W. Huntley, Saranac.
2670	James H. Huntly, Detroit.
1426	Albert H. Hurd, Davison.
1427	Charles W. Hurd, Davison.
258	Deodatus W. Hurd, Pokagon.
1750	George W. Hurd, Dundee.
1457	John H. Hurd, Detroit.
422	Ward H. Hurd, Marine City.
3437	J. Harvey Hutchings, Bancroft.
1122	William Hutchings, Leslie.
693	Lee N. Hutchins, Detroit.
3591	Allen Hutchison, Ann Arbor.
346	Robert J. Hutton, Detroit.

CERT. NO.	NAME AND RESIDENCE.
261	Fred A. Hutty, Grand Haven.
1492	Ellsworth E. Huyck, Clio.
1239	Judson E. Haymes, Gobleville.
1113	A. O. Hyde, Marshall.
1134	Harry J. Hyde, Cardiff, Tenn.
2836	Quincey A. Hyner, Delton.
1639	William J. Hyser, Ypsilanti.
3617	William Hyslop, Detroit.
2423	Esther Ince, Detroit.
1226	Richard Ince, Detroit.
1374	Frank Inglis, Detroit.
168	Edward J. Ingram, Iron Mountain.
1535	Luther Irish, Ferry.
2991	Charles N. Isham, Lyons.
2102	Adolph F. Isler, Calumet.
1856	Charles W. Ives, Belding.
2081	Jason W. Jackman, Caseville.
2908	Wilbur F. Jackman, Detroit.
2500	George W. Jackson, Dundee.
2643	Martha L. Jackson, Dundee.
2076	Henry Jacobs, Constantine.
624	George R. James, Schoolcraft.
632	Harriet E. James, Schoolcraft.
1125	John Jameson, Detroit.
376	John E. Jayne, Dewitt.
765	Edword R. Jebb, Climax.
3080	Frederick N. Jeffery, Swarts Creek.
439	Willard Jefts, Big Rapids.
2369	Charles C. Jenks, Jackson.
1102	Halsey B. Jenks, Ypsilanti.
3276	Christian G. Jenter, Ann Arbor.
3239	Jacob Jesson, Muskegon.
2072	Alfred Johnson, Adrian.
3277	Burt L. Johnson, East Saginaw.
3029	Charles B. Johnson, Palo.
2247	Charles W. Johnson, Flint.
2094	Chester B. Johnson, Adrian.
1384	Cora R. Johnson, Luther.
1783	Edward K. Johnson, Howell.
1117	Edwin G. Johnson, Luther.
3539	Emil Johnson, Muskegon.
2395	Henry Johnson, Caseville.
144	James G. Johnson, Traverse City.
97	John C. Johnson, Owosso.
3125	John J. Johnson, Newark, Ohio.
1918	Levi O. Johnson, Bellevue.
677	Sterry A. Johnson, Ogden Centre.
3484	Valdemar Johnson, Ironwood.
3607	William E. Johnson, Detroit.
1372	Ida S. Johnston, Detroit.
1269	Robert Johnston, Milford.
2499	William Johnston, jr., Detroit.
1371	William S. Johnston, Detroit.
580	Owin E. Jonas, Milan.
1548	Frank B. Jones, Ida.
1865	Frank E. Jones, East Saginaw.
3592	Fremen A. Jones, Muskegon.
3438	George D. Jones, Detroit.
1026	Lejune C. Jones, Kalamo.
2761	Levi Jones, Coldwater.
2896	Mervin A. Jones, Marquette.
3343	Shelley B. Jones, Greenville.
3387	Cornelius H. Jongejau, Grand Rapids.
1325	Charles R. Joy, Marshall.
1583	William H. Joy, Bath.
3508	Walter E. Judge, Detroit.
1104	Charles F. Judson, Brighton.
1105	Frank E. Judson, Brighton.
3344	John H. Judson, Alpena.
2785	John L. Judson, Newark, Ohio,
3345	Francis W. Julian, Yale.
2236	Peter W. Kane, Holland.
3509	Oscar Karmson, Detroit.
3439	William G. Kast, Jackson.
1600	Peter Katus, jr., Detroit.
3550	Allen McLean Kay, Carsonville.
762	George A. Kay, Detroit.
1240	Marie J. Kay, Shaftsburg.
1189	Thomas A. Kay, Shaftsburg.
1429	William J. Kay, Clinton, Ont.
1440	George Keech, Centerville.

CERT. NO.	NAME AND RESIDENCE.
1645	Charles S. Keefer, Middleton.
2737	Fred C. Keith, Lansing.
348	Robert Keller, Detroit.
2825	Victor Keller, Detroit.
1000	William H. Keeler, Saginaw.
1895	Charles E. Kelley, Seattle, Wash.
129	David Kelley, Lyons,
917	Frederick H. Kelley, Au Sable.
2838	William J. Kelley, Chicago, Ill.
2149	Alonzo F. Kellogg, Le Roy.
2137	Charles E. Kellogg, Grand Rapids.
2502	Ira W. Kellogg, Bancroft.
1184	James L. Kellogg, Portland, Oregon.
1185	John H. Kellogg, Portland, Oregon.
2335	Bernard Kelly, Seattle, Wash.
1820	Louis L. Kelly, Farwell.
1075	Frederick C. Kelsey, Ionia.
1072	William E. Kelsey, Ionia.
3041	William J. Kelsey, Cassopolis.
2751	Theodore Kemmink, Grand Rapids.
3140	Gustave Kempf, Detroit.
2640	Gustav A. Kenburg, Alpena.
1827	Ira C. Kendall, St. Louis.
3593	Edward M. Kennedy, Kalamazoo.
487	Ezra J. Kennedy, Detroit.
448	Thomas B. Kennedy, Commerce.
2351	William W. Kenyon, Howell.
121	Henry Kephart, Berrien Springs.
122	Walter Kephart, Berrien Springs.
3278	Henry S. Kergan, Detroit.
3127	William H. Kern, Detroit.
2508	Willis Kerns, Clarion.
3072	William Kerr, Bay City.
2896	John R. Kestell, Detroit.
1542	John B. Ketchum, Fremont.
1068	Otis E. Kewley, Tyre.
1083	William H Keys, Salzburg.
3279	Edwin L. Keyser, Birmingham.
138	Andrew J. Kidd, Benton Harbor.
160	Charles M. Kilbourn, Corunna.
159	Frederick M. Kilbourn, Corunna.
2779	John Kilgallin, Jackson.
1467	Robert H. Kilian, Ypsilanti.
2318	David B. Kilpatrick, Woodland.
1905	Henry C. Kimball, Chicago, Ill.
1906	John L. Kimball, Crystal Falls.
2748	Charles H. Kimber, Hamilton.
485	Dirk Kimm, Grand Rapids.
22	Martinus B. Kimm, Grand Rapids.
3388	Kenneth G. Kincaid, Olympia, Wash.
3594	Richard E. Kincaid, Hersey.
2294	Cassius A. King, Detroit.
2051	Fred H. King, Jackson.
735	Henry C. King, Oscoda.
3346	Isaac W. King, Jackson.
3188	John D. King, Detroit.
1235	Solon C. King, Ovid.
87	Greenlee P. Kingsbury, Vicksburg.
545	Paul C. Kingsbury, Novi.
90	Bruce F. Kinmont, Tekonsha.
80	Harry C. Kinne, Corunna.
2928	Edward C. Kinsell, Detroit.
1045	William S. Kinsell. Alpena.
262	John Kinsley, Manistee.
301	William W. Kinsman, Charlotte.
1036	Frank D. Kipp, Grand Rapids.
2396	William Kipp, Wheeler.
2798	Clarence D. Kirby, Philadelphia, Pa.
3441	Maurice S. Kirby, Grand Rapids.
3442	Thomas E. Kirby, Detroit.
3280	William C. Kirchgessner, Manchester.
1907	Charles H. Kirkwood, Ishpeming.
948	Philip B. Kirkwood, Negaunee.
3019	Adelbert Kirsten, Oscoda.
724	John W. Kirtland, Lakeview.
2217	Frank L. Kistenmacher, East Saginaw.
672	Joseph M. Kleefus, Detroit.
955	Theophil Klingman, Dexter.
2187	Charles J. Knapp, North Adams.
3023	William E. Knapp, Albion.
989	Henry C. Knill, jr., Port Huron.

CERT. NO.	NAME AND RESIDENCE.
284	Jesse D. Knowles, Richmond.
3143	Fred F. Kolb, Jr., Monroe.
1483	Charles S. Koon, Muskegon.
1474	Sherman J. Koon, Lisbon.
3128	Charles E. Koontz, Bremen, Ind.
1157	Charles W. Kotcher, Detroit.
3281	Leonard G. Kramer, Hammond, Ind.
2869	Benjamin S. Krause, Ann Arbor.
3179	Charles F. Kremers, East Saginaw.
2501	Henry Kremer, Holland.
3282	William H. Krug, Cleveland, O.
3283	Otto R. Kurz, Detroit.
1266	Walter K. Kwiecinski, Detroit.
1858	Edward M. Lacey, Sault Ste. Marie.
1770	Joseph LaCroix, Bay City.
1059	Mark H. Ladd, Plymouth.
3389	George L. Laigncald (?) Menominee.
3560	Bert Lamb, Detroit.
2529	Henry C. Lamb, Detroit.
2960	Andrew A. Lammie, Detroit.
1654	John Lamoreaux, Lakeview.
1879	Sarah A. Lamoreaux, Lakeview.
1241	Frank W. Lamphere, St. Johns.
1904	Charles N. Landon, Austin.
467	Issac D. Lane, Sand Beach.
1451	John A. Lane, Flint.
2017	Fred E. Langerman, Saginaw.
1222	Eugene L. Langworthy, Linden.
1886	Adelbert S Larabee. Tawas City.
2699	F. Denny Larke, Rogers City.
1739	Eustache LaRocque. St. Ignace.
713	Clifford M. LaRue, West Bay City.
2401	Frank N. Latimer, Ludington.
3347	George D. LaTour, Detroit.
1151	Theodore A. Laubengayer, Owosso.
1338	Charles A. Laughlin, Grand Rapids.
2944	Howard R. Laughlin. Minneapolis, Minn.
2371	John H. Lavin, Flint.
3444	John Frank Lavis, Detroit.
2104	George W. Law, Grand Rapids.
1439	Wellington J. Law, LeRoy.
2997	John H. Lawrence, Leslie.
1279	George S. Layerer, Bay City.
2639	James L. Lazier, Lakeview.
1228	James N. Leasia, Williamston.
1932	Albert B. Lee, Chicago, Ill.
1074	Allen Lee, Climax.
2402	DeLos W. Lee, Burr Oak.
805	Earl D. Lee, Manistee.
1593	Emma Lee, Climax.
3445	Ernest C. Lee, Detroit.
804	John Lee, Dexter.
3348	Thomas C. Leece, Munith.
1032	George L. LeFevre, Muskegon.
3002	James A. Leighton, Otsego Lake.
2912	Willis Leiseuring, Jackson.
851	Norman P. Leland, Gaines.
1586	Charles A. Lenhard, Detroit.
177	Theodore Lentz, Detroit.
1673	Hugh Leonard, North Muskegon.
2398	Gurley Lester, Capac.
1943	Norman Lester, Caro.
2929	Paul Leuschner, Detroit.
667	Richard Leuschner, Detroit.
678	Frank D. Levally, Tuscola.
997	Abbey Levers, Newaygo,
2961	Henry Levy, Ann Arbor.
3390	Moritz M. Levy, Charlotte.
2765	Hugo Leweaux, Grafton, No. Dakota.
2870	Charles D. Lewis, Memphis.
1314	David C. Lewis, Pontiac.
2871	Edgar D. Lewis, Otisville,
1243	Hosea A. Lewis, Ravenna.
3540	Jane R. Lewis, Otisville.
3034	John F. Lewis, Addison.
3146	Roland Lewis, Dowagiac.
3130	Edward C. Lieblin, Detroit.
1748	Henry M. Linabury, Pontiac.
512	Edwin C. Litchfield, Flint.
3284	Albert P. Lincoln, Axford.
3510	Albert W. Lindbohm, Ishpeming.

CERT. NO.	NAME AND RESIDENCE.
706	Howard J. Linsell, Detroit.
2218	Charles C. Linsley, Hamilton.
2827	Julius Lipezinski, Detroit.
960	Allen F. Little, Harwood.
2399	John S. Little, Elmer City.
2962	Orsmus Lloyd. Essexville.
2358	Simon H. Lloyd, Fostoria.
426	Arthur S. Lobb, Frankfort.
1658	John H. Lobdell, Flat Rock.
1400	Anna Locher, Grand Rapids.
1298	Henry E. Locher, Grand Rapids.
3285	Will S. Lockwood, Jackson.
755	Phil H. Loeffler, San Francisco, Cal.
1602	Richard E. C. Loew, East Saginaw.
3447	Joseph Lohrstorfer, Sarnia, Ont.
1251	George W. Lombard, Jackson.
382	Byron W. Long, Lansing.
1952	George L. Long, Detroit.
3212	James W. Long, Grand Rapids.
1625	John Long, Vicksburg.
1408	Edgar B. Longwell, Paw Paw.
1388	George W. Longwell, Paw Paw.
494	Harry D. Longwell, Paw Paw.
3164	Burt O. Longyear, Mason.
2067	Philo M. Lonsbury, Reed City.
1642	Dexter G. Look, Lowell.
2199	John Q. Look, Lowell.
617	A. D. Loomis, Clarion.
789	Arthur Loranger, Detroit.
769	Frederick Loranger, Detroit.
3349	Darius William Loree, Ridgeway.
2199	Aaron C. Losey, Ionia.
3391	Carlton J. Loucks, Detroit.
3078	Vincent A. Lowe, Benton Harbor.
3350	Homer D. Luce, Lansing.
1845	William O. Luce, jr., Caro.
3511	John W. Luckham, Sarnia, Ont.
3512	Albert I. Luke, Millington.
3513	Harry D. Luke, Wingham, Ont.
251	George D. Lunn, Edmore.
2425	Robert T. Lunn, St. Louis.
89	George L. Lusk, Bay City West.
890	Asahel H. Lyman, Manistee.
1218	James A. Lynch, Manchester.
1495	Alva G. Lyon, Mason.
321	Charlotte Lyon, Pittsford.
231	James J. Lyon, Zilwaukee.
1168	Octavius C. Lyon, Detroit.
389	Seth W. Lyon, Pittsford.
2541	Eli Lyons, Altona.
2397	H. H. Lyons, Imlay City.
415	Alexander McCabe, Crystal
1581	Thomas E. McCann, Midland.
2077	Albert B. McCollom, Port Huron.
2547	Fred A. McConnell, East Saginaw.
116	Marcus H. McCoy, Grandyville.
3288	George G. McCraken, Adrian.
249	Wilbur M. McCrossen, Bay City.
2107	Albert E. McCulloch, Berlin.
2131	Robert B. McCulloch, Berlin.
1681	George McCurdy, McBain.
449	David McDonald, Kalamazoo.
888	Donald A. McDonald, Muskegon.
3506	George McDonald, Kalamazoo.
2219	Matthew C. McDonald, Bad Axe.
529	Murdo McDonald, St. Johns.
1456	William McDonald, Kalamazoo.
2505	Duncan McDougall, Bay City.
2595	Alton O. McEuen, Perry.
603	James McEvoy, Manistee.
1876	Abraham F. McFarland, Waldron.
1612	Andrew McFarland, Detroit.
1614	James McFarland, Detroit.
2531	John McFarland, Detroit.
2931	Lewis McFarland, Detroit.
1613	William McFarlard, Detroit.
3595	Thomas H. McGee, Farmington.
3448	Peter McGibbon, Sarnia, Ont.
501	Albert E. McGregor. Alpena.
1634	Duncan McGregor, Harnsville.
1674	John McGregor, Harriaville.

CERT. NO.	NAME AND RESIDENCE.
2530	William H. McGregor, Detroit.
1230	George A. McHenry, Chippewa Lake.
134	Andrew S. McIntyre, St. Louis.
3287	Archibald G. McIntyre, Detroit.
2122	Jesse McIntyre. Ithaca.
2106	William D. McKay, Detroit.
480	Alfred W. McKee, Mt. Morris.
385	John D. McKenna, Shephard.
1257	W. N. McKenna, Concord.
1378	George W. McKenzie, North Branch.
566	John McKercher, Flint.
3351	Harry D. McKevitt, Grand Rapids.
3288	John H. McKibbon, Kalamazoo.
1498	John S. McKibbon, Detroit.
1499	Robert S. McKibbon, Detroit.
1868	Charles H. McKinster, Colon.
682	Harvey B. McLaughlin, Vernon.
211	Charles E. McLean, East Saginaw.
2680	Duncan McLeod, Detroit.
803	Francis McMahan, Au Sable.
3169	Charles McMauley, Grand Rapids,
1855	Neal McMillan, Rockford.
30	George H. McMullen, Ionia.
79	Fred J. McMutrie, Three Rivers.
2731	Byron McNeal, Byron Centre.
2458	Albert C. McNitt, Jennings.
1004	William H. McQuarrie, Luther.
1480	Ralph A. McWilliams, Grand Rapids.
108	Daniel T. Macdonald, Red Jacket.
102	Norman Macdonald, Red Jacket.
466	Charles R. Mackimmie, Algonac.
1090	George D. Mackimmie, Detroit.
345	John A. Mackimmie, Trenton.
3449	William Mackimmie, Detroit,
2296	James A. Macmichael, Ecorse.
1496	Thomas Madill, Detroit.
1901	L. C. Madison, East Jordan.
1902	Lora Madison, East Jordan.
3518	Max Magdelener, Detroit.
2336	John Magnusen, Ludington.
1914	James I. Main, Tekonsha.
3074	Fullerton B. Malcolm, Detroit.
78	Albert T. Mallory, Cambria.
336	Charles O. R. Malm, Ishpeming.
774	Gustav A. Malmgren, Iron Mountain.
622	Charles H. Manderville, Palo.
770	Della Mandigo, Sherwood.
255	Will R. Mandigo, Sherwood.
2357	Solomon Mandlin, Bridgeman.
1175	Albert Mann, Ann Arbor.
1717	Charles E. Mann, Bay City.
2930	Charles F. Mann, Detroit.
1311	Eugene G. Mann, Ann Arbor.
861	Henry W. Mann, Owosso.
2251	Charles W. Manning, Deerfield.
1686	James Manning, Deerfield
3036	Ella S. Manwaring, Dryden.
2457	Joseph Manwaring, Dryden.
815	Willard F. Marks, Tecumseh.
2085	Truman W. Marr. Asheville, N. C.
2982	William H. Marsh, Gregory.
931	Leonidas M. Marshall.
386	Albert F. Martin, Imlay City.
499	Calvin L. Martin. Elk Rapids.
2170	Edwin C. Martin, Capac.
285	Fred W. Martin, Pittsburg, Kan.
1567	Henry Martin, Jackson.
565	Susie A. Martin, Hopkins Station.
2679	William J. Martin, May.
84	Fred O. Martty, Bay City.
3450	Charles E. Martzloff, Buffalo, N. Y.
3451	William Marx, Detroit.
3596	John J. Maser, Lansing.
526	Charles A. Mason, Flint.
1772	Emmet C. Mason, Frontier.
1973	Freeman C. Mason, Ransom.
847	George B. Mason, Saline.
813	Jesse F. Mason, Warren.
785	John K. Mason, Bay City.
818	John P. Mason, Houghton.
378	Reuben B. Mason, Frontier.

CERT. NO.	NAME AND RESIDENCE.
1927	George M. Matthews, Chase.
1928	Hanna Matthews, Chase.
1294	Simon E. Matthews, Ashland, Wis.
2963	Carl L. Maurer, LeRoy.
3482	Frank N. Maus, Grand Rapids.
107	Marvin M. Maxon, Hudson.
1754	Edwin C. Maxwell, Carlton.
1133	Franz W. Mayer, Sebewaing.
1349	Adoniram J. Mayhew, Ypsilanti.
1234	Charles W. Maynard, Detroit.
857	Tancrede C. Maynard, Gagetown.
2715	Fred A. Meabon, Bangor.
1757	Charles H. Mead, Olivet.
777	Justin N. Mead, Escanaba.
1753	Alfred Meads, Ontanogon.
2682	Carl F. Meads, Ainger.
2460	Frank H. Meads, Olivet
1747	George A. Meads, Ironwood.
2461	Mordecai L. Meads, Olivet.
1592	John M. Meader, Battle Creek.
1877	John R. Means, South Haven.
1888	Elve E. Means, South Haven.
2295	David H. Meeker, Perrinton.
865	Morris I. Meigs, Reading.
437	Henry Melchers, East Saginaw.
1281	Albert F. Meloche, Belding.
3352	Albert O. Meloche, Anderdon, Ont.
3131	Felix Meloche, Sandwich.
3541	H. N. Meloche, Belding.
3075	William S. Menger, Alma, Ont.
3132	Charles H. Meriam, Flint.
643	Charles K. Meriam, Winnetka, Ill.
247	Frank P. Merrell, Ithaca.
2040	Frank H. Merrifield, Watervliet.
2837	Alvinza C. Merrill, Harbor Springs.
1663	Frank Merritt, Charlotte.
420	Fred A. Merritt, Dimondale.
3453	Gustave C. Merz, Monroe.
878	Daniel C. Meseroll, Jackson.
1620	Henry J. Mesick, Plainwell.
1023	Christopher C. Messenger, Howard City
398	Clarence H. Messinger, Hart.
461	Ormand W. Messinger, Spring Lake.
2035	Arthur A. Metcalf, Crystal Falls.
206	John Meyers, Mt. Clemens.
1530	John K. Meyers, Muskegon.
1678	Wesley C. Meyers, Woodland.
3454	Harry E. Mickey, Detroit.
245	John G. Mieler, Plymouth.
2872	John J. Milbourn, Charlotte.
24	Henry J. Milburn, Detroit.
2093	Leander B. Millard, Adrian.
772	Edward S. Millem, Farwell.
1199	Charles J. Miller, Pontiac.
1667	Charles T. Miller, South Saginaw.
3001	Edward E. Miller, Traverse City.
1038	Henry J. Miller, Vassar.
267	John C. Miller, Saugatuck.
3561	Mort F. Miller, Cadillac.
916	Nicholas Miller, Muskegon.
1208	William Miller, Lansing.
3354	George W. Milligan, Bay City.
1418	Thomas J. Milliken, St. Clair.
909	Frank S. Millington, San Antonio, Tex.
2832	John T. Millman, St. Johns.
3597	Melbourne G. Millman, South Lyons.
833	Lloyd M. Mills, Grand Rapids.
1851	Silas Millis, Denver.
2750	Thomas H. Mills, Port Huron.
1722	Willis J. Mills, Riverdale.
181	Gilbert D. Millspaugh, Elkhart, Ind.
2321	Charles H. Milner, Big Rapids.
2738	George W. Milner, Big Rapids.
3455	Thomas J. Milner, Big Rapids.
1288	Robert J. Minkley, Fowlerville.
171	George H. Mitchell, Birmingham.
2548	James G. Mitchell, Holly.
1828	John J. Mitchell, Detroit.
3076	Otto W. Mix, Manistee.
197	John H. Moe, Sturgis.
1924	Adolph R. Moeller, South Saginaw.

CERT. NO.	NAME AND RESIDENCE.
3227	Joseph C. Moeller, Detroit.
3392	William H. Moir, Grand Rapids.
3456	B. G. Monkman, Detroit,
1808	Samuel E. Monroe, Bangor.
34	George L. Montague, jr., Muskegon.
1031	Charles W. Montgomery, Horton.
3542	Uno Michael Montin, Ishpeming.
572	John S. Moon, Charlotte.
2123	Otis Moor, Cassopolis,
387	William B. Moor, East Saginaw.
1112	Albion L. Moore, Saginaw.
2676	Andrew Moore, Speaker.
2622	Augusta H. Moore, Speaker.
234	Carroll Moore, Traverse City.
1528	E. L. Moore Albion.
1294	Enos Moore, Litchfield.
388	John Moore, Ann Arbor.
1122	Lou G. Moore, Saginaw.
88	Marion C. Moore, Albion.
975	Martin M. Moore, Sanilac Centre.
2320	Orrin M. Moore. Howell.
1178	Charles Moorland, Hadley.
2638	Marilla Moorland, Hadley.
327	Gabriel C. Morehouse, North Adams.
314	John E. Morehouse, North Adams.
3353	Lewis H. Morehouse. Battle Creek.
1972	LeRoy Morgan, Platte.
1953	Lewis B. Morgan, Bellevue.
2847	Samuel F. Morgan, Saginaw.
1591	Walt B. Morgan, Bellevue.
1986	William M. Morgan. Jackson.
1291	Louis H. Morganthaler, Ionia.
3004	Henry M. Morris, Detroit.
870	Samuel S. Morris Pinconning.
1857	Andrew W. Morrison, Constantine.
1860	Thomas Morrison, Wayne.
3514	Charles W. Morse, Dowagiac.
2265	Ernest H. Morse, Wayland.
3:62	William Mortimer, Concord.
1500	Frank N. Mosher, Port Huron.
3013	Stephen A. Mosher, Soule.
289	Will C. Mosier, Paw Paw.
2782	Edward C. Mott, Detroit.
1799	Warren B. Mott, Benzonia.
711	John H. H. Mottram, San Francisco, Cal
757	J. Frank Mount, Oscoda.
3077	William Moxen, Mt. Clemens.
3028	Herbert Mueller, Detroit.
2754	John D. Muir. Grand Rapids.
821	Mary V. Mulberry, Big Rapids.
1252	Arthur Mulholland, Ashton.
3355	Walter S. Mumaw, Detroit.
1501	Arthur E. Mummery, Ann Arbor.
3515	William W. Munger, Grand Rapids.
1675	Archibald M. Munn, Kalamazoo.
2129	John A. Munson, Republic.
85	William Murch, Mt. Clemens.
189	J. William Murphy, Battle Creek.
3194	James Murphy, Detroit.
2913	Matthew Murphy, Lawton.
3598	Benjamin L. Murray, Detroit.
2532	Anna E. Mussell, Clare.
2507	Robert M. Mussell, Clare.
1168	George W. Myers, Gobleville.
1556	Gustavus Myers, St. Louis.
1187	Orvin W. Myers, Gobleville.
754	Theodore W. Myers, Saginaw.
2405	William F. Nagler, Howard City.
555	Joel J. Nash, Marcellus.
994	Percy F. Nasmyth, Detroit.
2190	Fred W. Neal, Coopersville.
763	Henry C. Neff, Detroit.
271	James C. Nelson, Manistee.
37	Frederick G. Neumeister, Muskegon.
3563	Wallace E. Newark, Brookfield.
3619	Adam Newell, Burnips Corners.
96	Cyrus P. Newell, Flushing.
1767	Isaac N. Newman, Detroit.
1345	Shadrack T. Newson, Grand Rapids.
3485	George Newton, Vicksburg.
1080	Philo B. Newton, Advance.

CERT. NO.	NAME AND RESIDENCE.
828	George B. Nichols, Martin.
3556	George B. Nichols, jr., Martin.
843	George H. Nichols, Hancock.
21	George W. Nichols, Grand Rapids.
1864	Harrison A. Nichols, Saline.
1865	Howard T. Nichols, Saline.
62	Oliver Nichols, Burr Oak.
2533	Frank W. Nicholson, Lansing.
3458	John H. Nicholson, Strathroy, Ont.
2048	Lemira Niver, Chesaning.
1660	Arthur W. Noble, Gunderson, Mon.
1208	Hulda E. Noble, Montgomery.
1116	James Noble, Montgomery.
883	Miner L. Noble, Muskegon.
2019	Gideon Noel, Good Hart.
1695	Albert Norris, Casnovia.
1696	James L. Norris, Casnovia.
66	Ezra O. Norte, Escanaba.
1502	Samuel J. North, Charlotte.
941	Burr D. Northrop, North Lansing.
1172	James I. Northrup, Stamwood.
2596	Denis J. Norton, L'Anse.
343	John T. Norton, Rochester.
3516	Lorenzo E. Norton, Hesperia.
1376	George J. Noteware, Bellaire.
1594	George W. Noyes. Mandan, No. Dakota.
1677	Edward C. Nutt, Cheboygan.
922	Hilen W. Ober, Flint.
1160	James R. O'Brien, Detroit.
1959	James P. Odell, Fremont.
1966	James R. Odell, Fremont.
1958	Salmon P. Odell. Fremont.
2297	Robert C. Ogilvie, Port Hope.
844	Frank P. K. Oldfield, Detroit.
308	Fred G. Oldworth, Grand Rapids.
1100	George H. Oliver, Grand Rapids.
1064	Laura A. Oliver, Grand Rapids.
2509	William E. O'Neill, Emmet.
1458	Rudolph Opperman, Detroit.
1665	Elmer N. Orr, Manistique.
904	John J. Orr, Tecumseh.
68	Louis P. Orth, Traverse City.
2981	Samuel A. Orth, Midland.
1697	Charles A. Osborne, Owosso.
3543	Charles L. Osborne, Traverse City.
1297	David F. Osborne, Fowlerville.
2700	Fred H. Osborne, Frederic.
731	George A. Osborne, Luther.
481	Oliver O. Osborne, Fenwick.
292	William E. Osborne, Grand Rapids.
270	Willis H. Osborne, Coldwater.
3079	Cornelius Ossewarde, Chicago, Ill.
3599	Jay B. Ostrander, Bay City.
1965	Riesdoff H. Ostrander, Stockbridge.
2772	Alton F. Otis, McBrides.
3517	Edwin F. Owen, Vestaburg.
72	Foster F. Owen, Vestaburg.
2763	John T. Owen, Jackson.
147	William H. Owen. Stanton.
736	Adolph Paalzow, Menominee.
3393	Homer H. Packard, Cheboygan.
2873	Charles O. Padley, Muskegon.
1408	James G. Padley, Milford.
1085	William A. Padley, Muskegon.
2429	Eliza I. Page, Grand Rapids.
2428	Jennie A. Page, Grand Rapids.
1798	William J. Page, Grand Rapids.
1792	Leslie E. Paige, Sparta.
1504	Henry Palmer, St. Johns.
451	Marion Palmer, Levering.
3357	Marion J. Palmer, Pottersville.
3459	Wallace Palmer, Ann Arbor.
2021	William A. Palmer, Carson City.
1721	Fred D. Paquette, Ludington.
436	Abram Parker, Pontiac.
2932	Arthur S. Parker, Detroit.
933	Charles H. Parker, Detroit.
1920	Edward W. Parker, Battle Creek.
1919	Fred S. Parker, Battle Creek.
970	George J. Parker, Port Huron.
2026	Homer L. Parker, Dryden.

CERT. NO.	NAME AND RESIDENCE.
2027	Ira E. Parker, Dryden.
914	Jared Parker, Springport.
394	Orlando J. Parker, Howell.
155	Charles P. Parkill, Owosso.
3222	Stanley E. Parkill, Owosso.
3289	Robert L. Parkin, Kalamazoo.
620	Edward A. Parkinson, Grand Rapids.
1508	T. Edmund Parkinson, Saginaw.
831	William Parks, Reese.
1088	Albert T. Parish, Byron.
1718	Henry Z. Parry, Detroit.
3134	Charles D. Parsons, Burr Oak.
1204	Edward P. Partlow, Laingsburg.
1202	Henry W. Partlow, Eagle.
1607	Clarence N. Passage, Greenville.
1621	John H. Passage, Greenville.
2908	Herman A. Passolt, Iron Mountain.
3394	Charles Pasternacki, Detroit.
1007	George L. Patch, St. Louis.
142	Alexis Patenaude, Norway.
3554	Albert A. Patterson, Grand Rapids.
323	Buchanan M. Patterson, Detroit.
2464	I. Mal Patterson, Millbrook.
2729	James B. Patterson, Detroit.
131	Louis Pauly, St. Ignace.
602	Price Peak, Mt. Pleasant.
1237	George W. Pearce, Ithaca.
3196	Joseph F. Pearl, St. Joseph.
1162	Anna Pease, Big Rapids.
88	Chester C. Pease, Hudson.
196	Jerome F. Pease, Big Rapids.
1588	Albert W. Peck, Petoskey.
1293	George K. Peck, Detroit.
1587	Horace Peck, Stetson.
11	John E. Peck, Grand Rapids.
402	John W. Peck, Attica.
1009	Thomas M. Peck, Grand Rapids.
419	Henry C. Peckham, Freeport.
2042	John W. Pedrick, Bangor.
2462	Lafayette F. Peet, Iosco.
1564	Huron D. Pegg, Morenci.
1558	Ives M. Pegg, Morenci.
1595	Theodore Peltier, Detroit.
1659	Homer J. Pelton, Oakwood.
2964	Orson C. Pemberton, Mecosta.
1046	Addison H. Pengally, Kalamazoo.
3135	John E. M. Pennington, Lincoln, Neb.
3460	Alfred B. Penton, Detroit.
3461	Thomas E. Penton, Richmond.
189	Charles M. Peocock, Corunna.
3518	John F. Peppler, Muskegon.
465	John N. Percell, Stevensville.
1648	Jason T. Perham, Kent City.
1975	Loren O. Perham, Spring Lake.
2463	George F. Perkins, Alpena.
2875	Thomas W. Perkins, Detroit.
1565	Luther Perrigo, Allegan.
1892	George S. Perrin, Detroit.
568	Daniel B. Perry, West Bay City.
143	Frederick W. R. Perry, Detroit.
2966	James E. Perry. Girard.
2768	John M. Perry, Tustin.
1997	Harrison Peters, Blissfield.
2933	Charles E. Pettit, Bad Axe.
3462	Irving E. Pettit, Grand Rapids.
621	Henry D. Pew, Palo.
272	F. B. B. Pfefferkorn, Manistee.
1576	Charles G. Phelps, Elwell.
1577	Drayton V. Phelps, Elwell.
1575	Emily L. Phelps, Elwell.
331	Lafayette A. Phelps, Saugatuck.
627	Dorr Phillips, Osseo.
543	Edwin F. Phillips, Armada.
609	Franklin S. Phillips, Ogden.
525	George C. Phillips, Armada.
606	Mary Phillips, Osseo.
2091	Will R. Phillips, Battle Creek.
3565	Edwin H. Pierce, Allegan.
1062	Marcenius L. Pierce, Detroit.
1974	William W. Pierce, Moline.
1222	Jay DeForrest Pierson, Kitchi.
3080	Leon R. Pierson, Kalamazoo.
356	Nelson Pike, Morley.
172	Cyrus A. Pinckney, Plymouth.
1848	Howard Pinkerton, Detroit.
1419	Robert J. Pinkerton, Detroit.
52	Fred H. Piper, Lansing.
2965	Clarence C. Pitkin, Whitehall.
1229	George L. Pitkin, Brighton.
629	Frederick Platts, Port Sanilac.
628	Rudolph Platts, Port Sanilac.
1558	Fred Plessner, Saginaw.
138	Alfred F. Plumb, Fenton.
2840	Fred W. Pollock, Clarksville.
2427	Mortimer C. Pomeroy, Capac.
125	William G. Poole, Cleveland, O.
1164	Albert H. Powell, Gladstone.
2774	Frank Powell, Grand Rapids.
1140	Milton B. Powell, Marshall.
1101	William Powell, Grand Rapids.
3136	Elmer L. Power, Barega.
400	Inez L. Power, Portland.
244	James O. Power, Addison.
243	Susan A. Power, Addison.
28	Charles F. Powers, Portland.
1631	Henry M. Powers, Ontanagon.
105	John E. Powers, Armour So. Dakota.
1068	Delbert E. Prall, East Saginaw.
1052	William E. Prall, Detroit.
1149	George O. Pratt, Detroit.
876	Stephen P. Pratt, Howell.
858	George Preston, Escanaba.
1420	Thomas W. Preston, Millbrook.
976	Christoph Preyz, Big Rapids.
3157	Fred R. Price, Sault Ste Marie.
3161	Carl G. Printz, Hancock.
2943	Mauritz R. Printz, Red Jacket.
1188	William H. Prittie, Detroit.
534	Arthur Punches, Springport.
1459	Herman B. Purmont, Saginaw.
995	Granville S. Purvis, Detroit.
3463	Christian Putcher, Detroit.
2966	Arthur S. Putnam, Manistee.
1590	George S. Putnam, Grand Rapids.
8	Lemure D. P .tnam, Grand Rapids.
43	William Putnam, Frederick.
2407	William H. Putnam, Goodrich.
2049	Henry J. Qua, Gaylord.
524	Samuel E. Qua, Gaylord.
1804	James J. Quarry, Ann Arbor.
741	John B. Quick, Seattle, Wash.
2338	Thomas D. Quinn, Muskegon.
431	Louis P. Racine, Birch Run.
36	John F. A. Raider, Newaygo.
537	James Raizon, Wakefield.
1878	Charles D. Rall. Jackson.
1394	Frank H. Ralph, Minneapolis.
3566	George Ramsell, Red Jacket.
1024	Byron O. Randall, Clinton.
822	John Randall, Mio.
140	Asa M. Randolph, Northville.
69	Henry Randolph, St. Louis.
3005	John F. Rank, Detroit.
1751	Daniel Rankin, New Era.
3395	James S. Rankin, Kalamazoo.
293	John M. Rankin, Richland.
3232	William G. Rankin, Detroit.
3567	Charles S. Rannels, Vermontville.
2342	Charles I. Rathbun, Fremont.
2708	George F. Rathburn, St. Charles.
2573	Charles H. Raven, Ceresco.
2572	Mary C. Raven, Ceresco.
396	George C. Ray. West Bay City.
2069	Owin M. Raymo, Wayne.
1904	Frank B. Raynale, Detroit.
2624	Emma Read, White Cloud.
2618	John G. Real, Baraga.
1370	Francis M. Reasner, Toledo, Ohio.
2067	John A. Reck, Lansing.
2878	Joseph A. Redmond, Sanilac Centre.
2409	Canby Reece, Caro.
354	J. P. Reed, Rockwood.

CERT. NO.	NAME AND RESIDENCE.
2202	James C. Reed, Albion.
2872	Orange B. Reed, Richmond.
2267	Samuel M. Reed, White Cloud.
2220	W. Taber Reed, Albion.
3204	Frank W. Reeve, Plainfield.
1093	John A. Reiber, Berrien Springs.
852	Michael Reidy, Corunna.
1689	Wm. F. Reimenschneider, Francisco.
3213	Harke E. Reinhart, Grand Rapids.
3358	William Remus, Grand Rapids.
195	William H. Rennels, St. Louis.
2914	Gustav A. Rentz, Detroit.
410	Arthur F. Retan, Hudson.
2980	Samuel Revel, Roscommon.
2268	Theodore A. Reyer, Detroit.
3168	Lewis C. Reynolds, Leslie.
3187	Linton E. Reynolds, Lansing.
1139	Walter B. Reynolds, Eaton Rapids.
2934	John P. Rheinfrank, Detroit.
384	Robert Ricaby, St. Joseph.
2967	Cassius E. Rice, Lennox.
1506	Dell F. Rice, Louisville, Ky.
263	John W. Rich, Manistee.
2876	Samuel C. Rich, Middleville.
817	Bennet Richards, Plainfield.
616	Emory A. Richards, Saranac.
498	Frank P. Richards, Detroit.
892	Lyman D. Richards, Manistee.
220	Thomas H. Richards, Detroit.
208	George W. Richardson, Ithaca.
2339	George W. Richardson, Dundee.
720	Olney H. Richmond, Bear Lake.
3008	Sarah C. Richmond, Bear Lake.
1976	Tyler W. Richmond, Bear Lake.
8621	Fred William Richter, Niles.
3519	Harry T. Richter, Tecumseh.
2877	Louis J. Richter, Saginaw.
3600	Vinton J. Rickerd, Charlotte.
710	Jay E. Ridout, Concord.
3568	Miles E. Riggs, Cheboygan.
1709	Fred E. Riley, Climax.
3620	T. E. Riley, North Branch.
339	Eugene Ringler, Saginaw.
2909	Eugene A. Ringler, New York, N. Y.
2085	John C. Rings, Shelby.
887	S. H. Rinker, Fenwick.
1808	Lafayette G. Ripley, Montague.
317	Mossom G. Ritchie, Metamora.
3601	Samuel B. Robb, Ann Arbor.
1352	Ford P. Robbins, Detroit.
1367	J. J. Robbins, Stanton.
1651	Daniel O. Roberts, Kalamazoo.
796	Byron G. Robertson, Breedsville.
2172	Donald Robertson, Detroit.
947	Eugene L. Robertson, North Lansing.
795	Hiram S. Robertson, Grand Rapids.
1655	Josephus M. Robertson, Blissfield.
3520	Milton H. Robertson, Detroit.
326	Edward J. Robinson, Detroit.
3464	George J. Robinson, Detroit.
3292	James H. Robinson, Jackson.
905	Lucius O. Robinson, Adrian.
2534	Ortin H. Robinson, Grand Rapids.
12	William H. Robinson, Detroit.
1787	William L. Robson, Williamston.
1114	William J. Roche, Lake City.
2626	Charles M. Rockwell, Burr Oak.
1424	Minott O. Rockwell, Burr Oak.
3197	Orlin M. Rockwell, Battle Creek.
1285	Henry W. Rodenbaugh, Breedsville.
1618	Isaac N. Rodenbaugh, Mancelona.
1008	Oscar S. Rodenbaugh, Mancelona.
2248	Otto W. Roeser, Saginaw.
2828	Walter H. Roesser, Detroit.
806	Frederick R. Roethlisberger, Allen.
561	Aaron Rogers, Ravenna.
1762	Allison H. Rogers, Sherwood.
691	Edward Rogers, Detroit.
1128	Edward J. Rogers, St. Clair.
1450	Enoch Rogers, Negaunee.
3165	George Rogers, Eaton Rapids.
2465	George C. Rogers, Burton.
1437	George G. Rogers, Buchanan.
633	LeRoy Rogers, Irving.
2796	Lester W. Rogers, Decatur.
2045	Frederick Rohner, Detroit.
1091	Sidney B. Rolison, Hesperia.
3396	Frank C. Rolland, Fenton.
393	Louis A. Roller, Edmore.
2968	William E. Root, Muskegon.
1619	Allen S. Rose, Churchill.
2742	John T. Rose, Petersburg.
3373	Robert Selden Rose, Ishpeming.
3228	Stoghten W. Rose, Traverse City.
3207	David D. Ross, Kalamazoo.
358	William H. Ross, Grand Rapids.
3602	Zimmerman Ross, Grand Rapids.
115	Arthur W. Roth, Detroit.
845	Elmer C. Rouse, Benton Harbor.
913	Christopher J. Rouser, Lansing.
849	Victor Roussin, Ludington.
1270	William Rowe, Ravenna.
3081	Walter D. Rowles, Battle Creek.
2845	William T. Roxburgh, Big Rapids.
3180	Henry Roy, Forrester.
2228	Burton Royce, Hamburg.
3486	William C. Royce, Sault Ste Marie.
2299	Herman N. Roys, Farwell.
1148	Louis Rucnty, Detroit.
3465	Arthur E. Rudolphi, Dowagiac.
435	Fred S. Ruggles, Byron.
3293	Adolph J. Ruhl, Houghton.
1342	John Rundel, Holton.
3139	Charles F. Runner, Shelby.
1194	J. Wallace Runner, Shelby.
2174	William F. Runner, Buchanan.
2914	Elmer G. Runyan, Disco.
3487	John Rupp, Oconomowoc, Wis.
1336	George D. Rushton, Eaton Rapids.
515	James Rushton, Eaton Rapids.
2625	Alto C. Russ, Lake Odessa.
112	John J. Russ, Lake Odessa.
3603	Dorian M. Russell, Sturgis.
814	Ellsworth E. Russell, Jackson.
1527	Robert H. Russell, Gaylord.
3202	Willis A. Russell, Ithaca.
2879	Guy Rutson, Chicago, Ill.
2665	Charles E. Ryno, Ryno.
2985	Suydam B. Ryno, Coloma.
1507	William I. St. John, Highland Station.
1582	Samuel M. Sackett, Monroe.
626	Orrin P. Safford, Flint.
2117	Abiram D. Salisbury, Midland City.
2881	Glen D. Salisbury, Bay City.
2551	Walter N. Salisburg, Midland.
1811	Cornelius K. Sampson, St. Louis.
3082	Charles A. Sams, Hart.
1347	Charles E. Samson, Ypsilanti.
1348	Henry W. Samson, Ypsilanti.
1824	Mary L. Samson, St. Louis.
3544	Frank A. Sandford, Grand Rapids.
373	Abraham Sanford, Grand Rapids.
3083	Theodore E. Sands, Battle Creek.
393	George W. Saunders, Riverdale.
3622	William S. Savage, East Saginaw.
1909	Edward Sawbridge, Stephenson.
1572	Ransom J. Sawyer, Menominee.
542	Joseph A. Sayers, Seney.
3569	Hiram Schall, Three Rivers.
1351	Joseph Schanher, Mt. Clemens.
2628	John J. Schefneker, Saginaw.
1616	John C. Scherer, Detroit.
3294	George M. Schettler, Detroit.
3466	Will M. Scheuerman, Detroit.
521	Martin F. Schick, Frankenmuth.
3397	Frank J. Schimansky, Oak Harbor, O.
1354	Gustavus R. Schimmel, Detroit.
31	Peter Schinitz, Pontiac.
3545	Frederick C. Schirmer, East Saginaw.
2071	Julius L. Schirmer, East Saginaw.
974	Fred A. Schlieper, Chicago, Ill.
3467	Oscar F. Schmid, Ann Arbor.

CERT. NO.	NAME AND RESIDENCE.
3521	Otto Schmidtt, Detroit.
2127	Paul Schmidt, East Saginaw.
3084	Walter K. Schmidt, Grand Rapids.
1998	Fred Schnoor, New Baltimore.
1233	Roelof A. Schouten, Grand Rapids.
2629	Victor E. Schratz, Detroit.
1416	Benjamin Schronder, Grand Rapids.
61	Frank A. Schulte, East Saginaw.
490	Louis S. Schultz, St. Joseph.
1153	Albert C. Schumacher, Ann Arbor.
2789	Deitrich A. Schumacher, Bessemer.
199	Felix Schuemacher, Gladwin.
2806	Anthony B. Schumaker, Grand Ledge.
2935	Phillip F. Schumann, Detroit.
3140	William H. Schweitzer, Marquette.
2602	Frederick J. Schossten, Holland.
399	Henry J. Scott, Seney.
2039	John P. Scott, jr., Delray.
2289	Stephen C. Scott. Howard City.
2040	William P. Scott, Delray.
2902	Charles L. Scoutten, Pinconning.
2802	George Scovelle. Manistee.
2706	E. G. Seaman, Marshall.
2576	Andrew W. Seed, Cass City.
2980	Charles A. Seeley, Lansing.
3096	William A. Seger, Spencer Creek.
1630	Melvin S. Segur, Quincy.
588	George F. Seibert, Iron Mountain.
1829	Michael L. Seibert, Mariette.
549	Margaret A. Seigert, Iron Mountain.
2786	Ford W. Sellars, Pinnebag.
1334	Robert W. Sellick, Flint.
3570	Richard A. Servis, Pentwater.
1198	Theophilus Seymour, Detroit.
1040	Jacob B. Shadley, Chicago, Ill.
719	Louis J. Shafer, Grand Rapids.
2667	Oscar F. Shaff, Vassar.
977	John M. Shaffer, Gladwin.
3295	John R. Shaffer, Elm Hall.
840	Alonzo L. Share, Detroit.
937	Byron L. Shaw, Adrian.
807	Clair M. Shaw, Muskegon.
3359	Mattie A. N. Shaw, Philadelphia, Pa
1922	Sylvester B. Shaw, Port Huron.
958	James A. Sheffield, Benton Harbor.
2970	William E. Sheffield, Benton Harbor.
2578	B. Ray Sheldon, Detroit.
204	Barber N. Sheldon, Quincy.
101	Hadley H. Sheldon, Bessemer.
2971	Wallace W. Sheldon, Oscoda.
2152	Arthur B. Shepard, Niles.
3296	Burt Shepard, Bronson.
123	Edwin J. Shepherd, Adrian.
2240	Will H. Sheppard, Three Rivers.
1318	Clarence C. Sherman, Otter Lake.
685	Manley H. Sherman, Okemos.
453	Clarence L. Sherwood, Dowagiac.
1956	Mary W. Sherwood, Dowagiac.
1523	Thomas J. Sherwood, Otia.
3398	Frank Shiley, Reading.
806	Fred W. Shireling, Grand Rapids.
3191	Earnest Shoff, Axtell, Neb.
775	Daniel L. Shook, Coral.
965	Adolph A. Shott, East Saginaw.
3024	George H. Shotwell, Mt. Clemens.
1509	Mortimer Shotwell, Mt. Clemens.
1666	Royal H. Shotwell, Leslie.
1524	Charles G. Shubel, Detroit.
2084	Oliver P. Shuler, Charlotte.
2142	William J. Shutter, Carson City.
489	Eugene I. Sias, Dowagiac.
2631	Watson A. Sibley, Muskegon.
117	Benjamin E. Sickler, Detroit.
355	Frank A. Sigler, Pinckney.
2599	Charles E Silver, Acme.
228	Leader Simoneau, East Saginaw.
607	Richard F. Simoneau, East Saginaw.
810	George B. Simons, Detroit.
3468	Edwin F. Sinclair, Detroit.
2251	Edmund V. Sinz, Grand Rapids.
1742	Victor Sinz, Grand Rapids.
605	John Skane, Ousted.
1727	Isabella Skyring, Loomis.
2589	Cynnias Slaght, Hart.
1894	Thomas Slattery, Benton Harbor.
1627	George R. Slawson, Greenville.
969	Edward E. Sloan, Clarkston.
282	Charles J. Slover, Mendon.
684	G. Watson Sly, Detroit.
1694	Frank E. Smallidge, Detroit.
1312	A. Lee Smith, Detroit.
1729	Albert E. Smith, Cadillac.
411	Arthur B. Smith, Trenton.
2998	Charles A. Smith, Addison.
2304	Charles D. Smith, Bedford.
3360	Charles E. Smith, Pontiac.
1272	Charles H Smith, Hillsdale.
453	Charles M. Smith, Oxford.
2305	Cyrenius C. Smith, Bedford.
2191	Frederick D. Smith. Coopersville.
176	Fletcher S. Smith, Saginaw.
2243	George T. Smith, Detroit.
1683	Harvey N. Smith, Carsonville.
2045	Henry A. Smith, Orleans.
782	Jay Smith, Saginaw.
877	John F. Smith, Ypsilanti.
1960	John W. Smith, Three Oaks.
2894	Malcom Q. Smith, Galien.
3141	Marie R. Smith, Chicago, Ill.
2972	Mills R. Smith, Ironwood
1794	Reuben A. Smith, Montague.
1946	Robert J. Smith, Au Gras.
3571	Samuel R. Smith, Grand Rapids.
2558	Sydney S. Smith. Carrollton.
1534	Timothy Smith, Galien.
3623	Will E. L. Smith, Fenton.
2030	William B. Smith, Marquette.
2382	William C. Smith, Grand Rapids.
2842	William W. Smith, Grand Rapids.
2550	Henry J. Smitzer, Utica.
3142	William J. Smythe, Detroit.
2999	William J. Snell, Grand Rapids.
1700	Daniel W. Snody, Forestville.
1699	Elizabeth H. Snody, Forestville.
1825	James R. Snody. Forestville.
3298	Charles Snow, Otter Lake.
760	Samuel M. Snow, Ludington.
1981	Ashbel W. Snyder, Three Rivers.
959	Charles N. Snyder, Shaytown.
2588	John Snyder, Mecosta.
3469	Walter C. Snyder, Horton.
3181	Washington Snyder, New Lothrop.
2988	Horace E. Soper, Indian River.
1739	Harry A. Sorg, Marine City.
3488	Charles Sorsen, Red Jacket.
2033	Charles A. Soule, Grand Rapids.
295	John J. Sourwine, Escanaba.
3361	Shadrack W. Southwick, Mayville.
1389	Asher D. Spalding, Leslie.
2249	Myrta L. Spalding, Leslie.
3408	Duane Salsbury, Leonidas.
2411	Harrison E. Spalsbury, Leonidas.
2410	Nelson C. Spalsbury, Leonidas.
2288	William H. Spayde, Bloomingdale.
2430	Adolph Speckhard, Watersmeet.
951	Albert L. Spencer, Belding.
2324	Charles A. Spencer. Oxford.
944	Edwin R. Spencer, Belding.
1510	Henry H. Spencer, Morenci.
926	James H. Spencer, Locke.
381	James P. Spencer, Fowlerville.
3000	M. Ella Spencer, Linden.
2078	Theodore H. Spencer, Gladwin.
832	Edward C. Spens, Alpena.
788	George B. Spenser, Linden.
874	James L. Spenser. Linden.
2414	Jay O. Spinning, Litchfield.
1729	Rollin J. Spofford, Hadley.
2325	William E. Spohn, Pinnebag.
1745	Norman B. Sponenburg, Yale.
2467	Otto L. Sprague, Owosso.
162	Wesson G. Sprague, Flushing.

CERT. NO.	NAME AND RESIDENCE.
213	John W. Squires, Marine City.
3572	Alva P. Sriver, Grand Rapids.
2007	Edward O. Stafford, Marquette.
3145	Fred A. Stafford, Cadillac.
2008	Henry H. Stafford, Marquette.
859	Joseph Stafford, Newberry.
3176	Charles E. Stanger, Dundee.
2535	William H. Stanhope, Scottville.
1174	Charles D Stanley, Onekama.
313	Henry N. Stanton, Sheridan.
723	Milton B. Stanton, Sheridan.
2601	Louis H. Staples, Detroit.
2600	Mary M. Staples, Detroit.
881	Alonzo D Stark, Burlington.
2627	Richard Starling, Eastmanville.
1468	George E. Starr, Plainwell.
225	W. S. Starring, Rochester.
2881	Frank A. Statz, Detroit.
471	Edwin R. Stauffer, Camden.
1406	William W. Stawson, Greenville.
338	Charles A. Stebbins, Lawrence.
3068	Edgar A. Steele, Menominee.
1873	Michael Steele, Ionia.
1944	William C. Steers, Wayne.
1814	Fred K. Steinkohl, Manchester.
694	Albert G. Steketee, Grand Rapids.
3144	George E. Steketee, Grand Rapids.
659	George G. Steketee, Grand Rapids.
667	John G. Steketee, Grand Rapids.
1805	William F. Stemm, Berrien Springs.
1402	George J. Stephenson, Bangor.
3362	Leslie Cl. Sterling, Carsonville.
1428	Alviso B. Stevens, Ann Arbor.
312	Charles R. Stevens, Northville.
217	Fred D. Stevens, Detroit.
3470	Grant W. Stevens, Detroit.
2978	William S. Stevens, Detroit.
737	Augustus W. Stevenson, Muskegon.
2341	Harry D. Stevenson, Detroit.
3018	Melvin Stevenson, Otsego Lake.
1511	William E. Stevenson, Bay City.
1068	Abner B. Stevic, Waldron.
2154	Alexander J. Stewart, Detroit.
3471	C. Francis Stewart, Hessell.
474	Frederick S. Stewart, Pontiac.
3216	Harry E. Stewart, Grand Rapids.
3146	James A. Stewart, Gladstone.
2201	Kate F. Stickney, Gowen.
2513	Summer Stickney, Gowen.
1987	Alice Stimson, Parma.
1988	Charles E. Stimson, Parma.
665	Edgar Stinchcomb, Sunfield.
397	James W. Stiner, Unionville.
2803	Palmer T. Stocking, Harvard.
3363	C. Eugene Stoddard, Washington, D. C.
450	Clarence B. Stoddard, Monroe.
1464	Clarence G. Stone, Detroit.
1929	Joseph B. Stone, Vermontville.
574	William H. Stone, Portland.
3299	William J. Stone, Ypsilanti.
654	Albert Stonehouse, Grand Rapids.
2537	David E. Storms, Harrisville.
1656	Louis Storz, Royal Oak.
100	Henry E. Stover, Kalkaska.
2269	John M. Stowe, Brooklyn.
1522	Tim P. Stowe, Howell.
544	John D. Strachan, Muir.
1637	Allie E. Stringer, Detroit.
1633	George W. Stringer, Detroit.
1763	William T. Stringham, Shelby.
281	John J. Strohm, Constantine.
3364	Edgar J. Strong, Reed City.
2987	Wilford C. Stryker, Dayton.
2630	Fred G. Stuart, South Boardman,
2414	William F. Stuart, Kalkaska.
1152	Gustav Suedekum, Potts.
2468	James W. F. Sumners, Gould City.
2883	Frank I. Surridge, Niles.
3604	John Bird Sutton 2nd, Ann Arbor.
940	J. Frank Suydam, Alma.
1150	Gustavus A. Swaby, Bay City.

CERT. NO.	NAME AND RESIDENCE.
2511	Ira E. Swart, Auburn.
3300	Edna Swayze, Otisville.
729	Eleazer S. Swayze, Otisville.
2111	Alice M. Sweet, Carson City.
1694	B. Frank Sweet, Carson City.
2075	Franklin E. Sweetser, Port Huron.
2466	Judson S. Sweezey, Bunker Hill.
1512	George Swift, Detroit.
1555	Scott S. Swigart, Grand Ledge.
2575	John W. Switzer, Disco.
3624	Wilbur Sylvester, Port Huron.
1360	Allen H. Taggert, Detroit.
3088	Fred J. Taggert, Kalamazoo.
2470	James M. Taggert, Detroit.
3592	James N. Taggert, Olivet.
148	Charles N. Talbot, Flushing.
2245	Joe V. Tallman, Pendelton, Ore.
1464	Lewis L. Tallman, Three Rivers.
3302	George C. Tappen, Jackson.
2690	Charles F. Tarnstead, Oxford.
541	Celia W. Taylor, Loomis.
340	Edward H. Taylor, Vassar.
341	Edward J. Taylor, Reese.
2198	George W. Taylor, Paw Paw.
3301	Harry S. Taylor, Detroit.
2747	Henry J. Taylor, Gladwin.
1227	James A. Taylor, Detroit.
680	John L. Taylor, Ionia.
2579	Leander L. Taylor, Dustville.
1326	P. Corey Taylor, Mt. Pleasant.
3605	Frank J. Temple, Ridgeway.
1728	Winfield S. Temple, Grand Rapids.
2327	Clements Tepoorton, Bay City.
2941	Frank A. Tepo rten, Bay City.
1309	Butler E. Terrill, Muir.
3472	Willard S. Terrill, Sand Lake.
587	Isah C, Terry, Muskegon.
2270	Jeremiah G. Terry. Detroit.
2158	Kelly J. Terry, Waterford.
1884	Frank E. Thatcher, Ravenna.
875	Ezra W. Thayer, Lyons
2153	Martha J. Thayer, Carson City.
2907	William H. Thayer, Carson City.
779	Frank G. Thiers, Elsie.
1746	Charles W. Thomas, Wyandotte.
2039	Eugene D. Thomas, Centreville.
1355	Frank C. Thompson, Ionia.
744	Frederick H. Thompson, Manistique.
3304	John Thompson, Adrian.
2041	Merritt L. Thompson, Greenville.
2805	Mason S. Thompson, San Francisco, Cal.
1609	James B. Thornton, Sturgis.
1784	T. Franklin Thornton, Sturgis.
3299	Calvin J. Thorpe, Coldwater.
3523	Harry Thorpe, Warren, Ind.
953	Ferdinand Thum, Grand Rapids.
952	Hugo Thum, Grand Rapids.
743	William Thum, Grand Rapids.
3306	C. Milton Thurston, Ann Arbor.
1300	James O. Thurston, Almont.
2060	William H. Tibbs, Grand Rapids.
2223	Arthur H. Tibbets, Port Huron.
214	Elbert P. Tibbals, Port Huron.
201	William J. Tillotson, Laingsburg.
563	Fred P. Tillson, Ishpeming.
764	Brunswick E. Tilton, Bay City.
3365	John A. Tinholt, Muskegon.
3400	William J. Toal, Detroit.
1307	Nelson I. Tobey, Sturgis.
1652	Hora e A. N. Todd, St. Ignace.
1278	William F. Todd, Saginaw.
3090	William W. Todd, Jackson.
2638	Frederick C. Toelle, Detroit.
463	Louis W. Toles, Marquette.
673	John Tolfree, West Branch.
1461	Albert E. Tomlinson, Saginaw.
966	William A. Tomlinson, Au Sable.
2794	George B. Topping, Columbus, O.
1005	Geo. W Topping, Dewitt.
1647	James B. Townsend, Jackson.
2348	Lyman W. Trask, Kalkaska.

Michigan State Pharmace

Next Meeting, Grand Rapids, Augus

DE·

To the Pharmacists of Michigan:

The benefits of organi
and advantage, are apparent and well known to you. The dr
ship in a body formed and conducted for the conservation of
contemplated legislation inimical to his own welfare and lowe
he serves. These attacks, wilfully or ignorantly instituted,
with community of interests, this body having infinitely more
force.

In the advancement of professional science and trade a
strongly felt. The advantages of this State Pharmaceutical
position to you. This association is in dead earnest in trying
benefit of the retail druggist and his clerk, as well as for their

To non-members, we would say, we want you in this ass
sive, business druggist in the state to join us. Come to the n
enter into the debates and discussions. PASSIVE members sho
petty jealousies or minor considerations stand in the way of g

Employes are invited to become members, because
hours, Sunday work, etc., they may have them brought before
dress. Employers can discuss ways and means for making thei
to betterment of methods of business, of manipulation, of dispe
and better relations between themselves and physicians.

Benefit must surely accrue to each and every member o
have just become registered pharmacists, through passing th
urged to become members of this association. Then, too, sug
various committees. If you have any suggestions to make reg
the committee on legislation. If some matter of adulteration
ticular article interests you, apply to the committee on ad

1982 Arthur V
329 Henry A.
4189 George F. ... Detroit.
3308 Simon Verburg, Detroit.
3233 James Vernor, Detroit.
700 Earl J. Vickery, Flushing.

... Forrest M. Webber, Detroit.
3311 Alfred M. Webster, Oscoda.
3310 James A. Webster, Detroit.
1779 Bryant Weed, Grand Rapids.
956 John Webster Weed, Deckerville.

ıtical Association.

2, 3 and 4, 1892.

SECRETARY'S OFFICE,
ROIT, MICH., Box 583, January 31, 1892.

ıtion in any calling, for mutual protection
ıggist, especially, is benefited by member-
ıis interests. He is ever in danger from
ring to the relation he bears to the public
are best warded off by union into a body
power than the aggregate of individual

ıd financial interests is the power of union
Association are evident and need no ex-
to accomplish all it can for the practical
advantage in the science of pharmacy.

ociation. We want every active, progres-
xt meeting, bring your hobbies with you,
ıld become ACTIVE workers. Do not let
od, strong united work.

they have grievances, such as too long
the association for consideration and re-
help more capable, can gain ideas tending
ısing facility and skill, for fostering closer

such an organization. Young men who
Board's examination, are in particular
stions are invited from druggists to our
ding our Pharmacy Laws, send them to
tion as to the quality of any par-
to the committee on pharmacy

CERT. NO.	NAME AND RESIDENCE.
2345	Milan A. Trask, Kalkaska.
1945	Reuben S. Trask, Kalkaska.
2044	Kate E. Traver, Detroit.
2043	Newton H. Traver, Detroit.
580	Fred A. Travis, St. Johns.
1135	Elight Treadgold, Luther.
3366	George H. Treadgold, Marysville.
1051	Peter F. Treanor, East Saginaw.
1993	Alanson B. Treat, Adrian.
1992	George A. Treat, Adrian.
2985	Owen R. Tredway, Detroit.
3401	Edwin Felix Trempe, Alpena.
1417	Henry Trevidick, Grass Lake.
2884	Burrill Tripp, Cedar Springs.
2192	Charles K. Trombley, Detroit.
2778	Richard W. Trotter, Toronto, Ont.
447	Theodore Trowbridge, Grand Rapids.
2087	Albert B. Truesdale, Mattawan.
3229	John M. Truscott, Cass City.
2225	Cyrus C. Tubbs, Chesaning.
1580	Alfred H. Tucker, White Rock.
2708	William D. Tucker, New Hudson.
1169	Winfield S. Tucker, Big Rapids.
641	Frederick L. Tupper, Meredith.
510	Dell D. Turner, Fairbault, Minn.
2114	Robert Turner, Flat Rock.
479	Samuel P. Tuttle, St. Louis.
1432	William A. Tuttle, Holly.
2792	William C. Tuttle, Albion.
428	Henry V. Tutton, Benton Harbor.
3578	Fred S. Tuxsbury, Stetson.
59	John B. Tweedale, Muskegon.
3402	Gerry H. Uglow, Black River.
1518	James N. Upham, Sturgis.
2915	Eugene S. Upson, Durand.
344	Frank Utley, Hesperia.
1271	Herman VanAllen, Ionia.
3160	William E. Vanande, Sunfield.
3403	Garret A. VanArkle, Muskegon.
3148	Dirk VanBree, Zeeland.
2084	Duane B. VanBuren, Battle Creek.
1096	Harmon VanBuskirk, Pine Run.
800	James H. Vandecar, North Branch.
1899	Levi B. VanDecar, Marion.
1316	John H. C. VanDeinse, Greenville.
1385	Peter VanDeinse, Muskegon.
1597	Nicholas Vandenbelt, Detroit.
2718	Peter VanDenBerg, Ann Arbor.
1047	Burten VanDenBerg, Alma.
3091	Clarence R. Vanderpool, Grand Rapids.
14	Jacob Vanderveen, Grand Haven.
3594	Henry Vandervelde, Portland, Ore.
3170	Francois VanDugterin, Grand Rapids.
3195	Florentine H. J. VanEmster, Bay City.
3306	Henry S. VanEtta, Hudson.
3016	Clarence G. VanEtten, Lyons.
2065	Henri VanGieson, Grand Rapids.
3478	Louis C. VanGorden, Eaton Rapids.
163	William H VanLeeuwen, Grand Rapids.
2886	Volney C. VanLiew, Vestaburg.
1180	Ezra VanMarter, Jackson.
3546	James F. Vannest, Peck.
2691	Edward T. VanOstrand, Allegan.
1146	Spencer VanOstrand, South Haven.
1087	William VanPutten, Holland.
1246	Pomeroy VanRipper, Onandaga.
685	Clarence VanSickle, St Johns.
47	Nicholas F. L. VanSlype, Salem, Ore.
2157	Robert J. VanWoert, Battle Creek.
1550	Edward C. Varnum, Jonesville.
1551	Freeland C. Varnum, Jonesville.
1552	Grosvenor C. Varnum, Jonesville.
58	Barrett D. Vaughan, Bellevue.
3474	Fred Vaughan, Ludington.
1085	Orley M. Vaughan, Covert.
3525	William H. Vaughan, Oscoda.
3625	Michael VanVliet, Detroit.
1243	George D. VanVrankin, Cadillac.
2581	H. L. VanVrankin, Alamo.
2175	Frank W. VanWickle, Shelby.
870	Edward H. Vedder, West Bay City.
1862	Arthur Veitch, May.
329	Henry A. Venema, Menominee.
4189	George F. Vennard, Detroit.
3308	Simon Verburg, Detroit.
3233	James Vernor, Detroit.
700	Earl J. Vickery, Flushing.
663	Levant A. Vickery, Flushing.
988	Fred C. Vilas, Stambaugh.
1826	James T. Vincent, Lapeer.
2375	Shad N. Vincent, Lapeer.
3092	Carry Vinning, Lake View.
3547	Edward Charles Voght, Escanaba.
2310	James H. Voller, Evart.
372	Richard VonBochove, Grand Rapids
3307	Erich VonNostitz, Detroit.
3626	Geo. VonNostitz, Detroit.
249	G. L. F. VonWalthausen, Bay City.
1182	Werner VonWalthausen, Bay City.
2201	Robert C. Voorhees, Detroit.
925	Adin C. Wait, Coats Grove.
3475	Cora L. Wait, Traverse City.
714	S. Edwin Wait, Traverse City.
1221	George W. Wait, Coldwater.
2379	John N. Wait, Hudsonville.
728	Charles H. Wagener, Big Rapids.
2415	John W. Wagener, Adrian.
2416	Louis A. C. Wagener, Adrian.
456	Floyd G. Wager, Wolverine.
2695	Adam Wagner, Eastmanville.
99	George W. Wagner, Jr., Detroit.
124	Henry L. Wagner, Adrian.
1584	Charles A. Wakeman, Whittemore.
2655	Mary E. Wakeman, Whittemore.
1328	Hattie A. Walbrecht, Wayland.
652	Adam Waldorf, Detroit.
1098	Edward G. Waldron, South Bend, Ind.
2377	Zaremba W. Waldron, Jackson.
300	Tracey P. Wales, Bay City.
2974	Alfred L. Walker, Detroit.
1078	Daniel B. Walker, Grass Lake.
2582	Lyman E. Walker, Oak Grove.
1596	Watson K. Walker, Lansing.
1079	William H. Walker, Grass Lake.
2608	William H. Walker, Trufant.
3093	John L. Wallace, Kalamazoo.
2606	Elihu Walling, Lamont.
3094	Ezra Walling, Coopersville.
2607	Millard F. Walling, Lamont.
1412	Frank I. Walsh, Holland.
1421	Heber Walsh, Holland.
1411	Walter C Walsh, Holland.
827	Grafton Waples, Houston, Texas.
1029	George J. Ward, St. Clair.
2852	John F. Ward, Detroit.
1366	Walter A. Ward, Eau Claire.
1247	Fremont C. Warne, East Jordan.
2130	William L. Warne, East Jordan.
2888	Edmnnd L. Warner, Marlette.
3606	John A. Warner, Dowagiac.
361	Spencer H. Warner, Marlette.
1443	William A. Warner, Detroit.
846	Andrew J. Warren, Saline.
2311	D. W. Warren, Edenville.
1626	Dallas Warren, Milford.
1601	John C. Wastell, Port Huron.
468	William Wastell, Port Huron.
1127	Dwight E. Waters, Remus.
3309	Alva F. Watkins, Jackson.
3548	David Watson, Detroit.
1606	David L. Watson, Detroit.
357	John B. Watson, Coopersville.
596	Louis M. Watson, Allegan.
806	Robert A. Watson, Detroit.
3149	Robert A. Watson, Caro.
1615	Samuel C. Watson, Detroit.
984	William O. Watson, Breckinridge.
2139	Henrietta Watts, Grand Rapids.
2103	Herman G. Watts, Saginaw.
2515	Isaac Watts, Grand Rapids.
3367	Allen B. Way, Lyons.
1862	Justus H. Weaver, Montgomery.
1679	Leland S. Weaver, Freemont.
2976	William H. Weaver, Montgomery.
135	Byron S. Webb, Alma.
546	Egbert T. Webb, Jackson.
230	Henry J. Webb, Cassopolis.
2583	Walter B. Webb, Jackson.
650	Arthur H. Webber, Cadillac.
3574	Forrest M. Webber, Detroit.
3311	Alfred M. Webster, Oscoda.
3310	James A. Webster, Detroit.
1779	Bryant Weed, Grand Rapids.
956	John Webster Weed, Deckerville.

CERT. NO.	NAME AND RESIDENCE.
528	Perry Weed, Pontiac.
816	Ambrose A. Weeks, Grand Rapids.
1948	Eugene J. Weeks, Jackson.
104	George Weeks, Augusta.
1559	James E. Weeks, Battle Creek.
1275	Harry Weiler, Ionia.
2380	Joseph W. Weimer, Benton Harbor.
57	Charles G. Weisinger, Adrian.
109	Herman L. Weise, Detroit.
1661	Julius Weiss, Monroe.
927	William A. Welch, Buchanan.
1598	Emma P. Weller, St. Johns.
1476	Martin Weller, St. Johns.
637	Charles A. Wells, Yale.
1947	Frank Wells, Lansing.
406	Isaac E. Wells, Athens.
3214	James N. Wells, Escanaba.
3526	Wilford W. Wells, Detroit.
1628	William M. Wemp, Edmore.
2152	Max Wenzl, jr., Brinton.
3549	August Werner, Saginaw.
185	John G. Wert, Laingsburg.
3150	John Weseser, Owosso.
1786	Ben E. West, Grand Rapids.
3527	John A. West, Detroit.
221	John H. Westendorf, Mt. Clemens.
996	Charles Westfall, Ypsilanti.
1315	Charles E. Westlake, Grand Rapids.
893	Theodore A. Wetzel, Ann Arbor.
3404	Archie Wheeler, Muskegon.
1731	Charles F. Wheeler, Hubbardston.
1249	George Wheeler, Muskegon.
2896	LeGrand Wheeler, Muskegon.
3312	William C. Whelock, Jackson.
241	B. J. Whelpley, Mulliken.
579	Ida E. Whelpley, Mulliken.
1076	George N. Whipple, Detroit.
2570	Clarence H. White, Grand Rapids.
3627	Claude White, Lake View.
517	Clay M. White, Grand Rapids.
669	Emmet R. White, Alanson.
3011	F. Estelle White, Williamsburg.
2328	George J. White, Jackson.
1195	Lyman T. White, Eaton Rapids.
1543	Orange E. White, Little Rock, Kan.
1710	William E. White, Grand Rapids.
98	William L. White, Grand Rapids.
170	Almeron Whitehead, Birmingham.
3368	William T. Whitelaw, Saginaw.
3235	Maitland J. Whiteley, Chicago, Ill.
593	George K. Whiting, Union City.
793	S P. Whitmarsh, Palmyra.
2252	Casper Whitney, Detroit.
3166	Lewis Whitney, Muskegon.
2304	Robert L. Whitton, Ewen.
1220	Charles D. Wicker, Coldwater.
1466	Frank E. Wicks, Detroit.
675	John G. Wiesinger, East Saginaw.
1124	John G. Wiesinger, Detroit.
1143	Allen H. Wiggens, Lawrence.
1431	Charles H. Wilbur, St. Ignace.
472	George D. Wilcox, Eaton Rapids.
1693	Albert J. Wilders, Ortonville.
2869	Edwin P. B. Wilder, Chicago, Ill.
520	Fred C. Wilkens, Union City.
1852	Charles Wilkinson, Colon.
914	James E. Wilkinson, Crystal Falls.
259	Thomas Willard, Bear Lake.
998	John L. Willett, Flint.
3528	Charles Williams, Woodland.
3369	Fred J. Williams, Lansing.
725	Henry M. Williams, Mason.
752	Jean P. Williams, Akron.
2898	Oliver C. Williams, Muskegon.
3096	P. Taylor Williams, Grand Rapids.
278	Samuel Z. Williams, Coldwater.
342	George E. Williamson, Bay City.
347	John Williamson, Detroit.
1108	Lewis I. Willitts, Mackinaw City.
2011	George W. Wilmot, Fenton.
297	Adolph H. Wilson, Grand Rapids.
1822	Charles A. Wilson, Holly.
1749	David G. Wilson, Dundee.
349	Edward R. Wilson, Grand Rapids.
2604	Ephraim Wilson, Stanwood.
3529	Franklin S. Wilson, Mt. Clemens.
915	George A. Wilson, Petoskey.
1980	Jay Wilson, Chippewa Falls.
562	Lee S. Wilson, Le Mars, Iowa.
164	Madison V. Wilson, Sand Lake.
3628	Purvis S. Wilson, Dresden, Ont.
2431	W. J. Wilson, Belding.
2556	Walter J. Wilson, Detroit.
3218	Wilard C. Wilson, Detroit.
1070	William B. Wilson, Detroit.
3097	William E. Wilson, Binghamton, N. Y.
2329	William L. Wilson, Detroit.
194	Lewis Winans, Chelsea.
2975	William V. Windover, Detroit.
67	Willard S. Winegar, Lowell.
1605	Henry H. Wines, Howell.
3477	Charles W. Wing, Detroit.
3236	William E. A. Wing, Detroit.
2178	Daniel Winter, Grand Rapids.
2163	Frank B. Winter, Grand Rapids.
1056	Curtis J. Winslow, Lees Corners.
855	Frank A. Winslow, Saugatuck.
704	Enos J. Wirt, Sault Ste. Marie.
478	Emmet Wiseman, Big Rapids.
2271	Calvin A. Wisner, Columbiaville.
1377	Pierre E. Witherspoon, Harrison.
1057	William G. Witthauer, Bay City.
1685	John G. Wolf, Hillsdale.
351	L. M. Wolf, Hudsonville.
2113	William P. Wolf, Grand Rapids
2635	Charles S. Wolfe, Traverse City.
3297	Franklin E. Wolfe, Metamora.
1518	Louis Wolff, Jackson.
1353	Allen E. Wood, Jackson.
205	Charles F. Wood, Adrian.
1840	Ella Wood, Six Lakes.
1714	George A. Wood, Detroit.
3405	Homer R. Wood, Kalamazoo.
895	J. Charles Wood, Oscoda.
1369	John T. Wood, Burlington.
868	Stephen A. Wood Buchanan.
1724	Theressa J. Wood, Monroe.
2617	Warren P. Wood, Matherton.
1084	Will H. Wood, Sheridan.
1854	William A. Wood, Six Lakes.
740	William D. Wood, Burlington.
973	George B. Woodard, Brutus.
3151	Benjamin F. Woodbury, Homer.
1537	Eli Woodman, Farmington.
1138	Charles H. Woods, Detroit.
2516	Francis W. Woods, Matherton.
492	Oren E. Woods, Cassopolis.
1080	Thomas T. Woods, Belleville.
1077	Viola G. Woods, Belleville.
64	C. Elmer Woolfinger, Hopkins Station.
1971	Rufus S. Woolford, Detroit.
1217	Fred F. Woolsey, Hartford.
3530	Grant J. Woolsten, Jackson.
3370	Austin B. Wooten, Milford.
325	Frank W. Worcester, Silver City, N. M.
2634	Alva Wright, Michigamme.
949	Charles A. Wright, Tecumseh.
2330	Edward A. Wright, Pentwater.
3371	William H. Wright, Evanston, Ill.
7	Frank J. Wurzburg, Grand Rapids.
2177	Henry S. Wyman, Morenci.
2942	John Wyne, Bryden, Ont.
1759	Charles Yarrington, Milford.
1867	Alonzo Yates, Allen Creek.
3098	Harry W. Yates, Marquette.
2242	Oscar E. Yates, Holland,
2312	Joseph S. Yelter, Lowell.
414	Erastus T. Yeomans, Ionia.
2900	Milan A Yeomans, Kingston.
78	George H. Yerrintom, Alma.
1897	Frank E. Youmans, East Saginaw.
3099	Andrew P. Young, Detroit.
1434	Charles Young, Allegan.
174	Charles A. Young, Battle Creek.
3531	Edward Young, Detroit.
198	Elbert A. Young, Clio.
3100	Frank J. Young, Detroit.
3406	John Young, Chicago, Ill.
401	Sylvanus E. Young, Lakeview.
3372	Jonathan A. Zahn, Detroit.
2115	Henry Zeran, Prescott.
2815	Will A. Zimmer, Manistee.
912	Jacob Zimmerman, Flint.
2990	Joseph S. Zukoskie, Grand Rapids.

REGISTERED ASSISTANTS IN MICHIGAN.

CERT. NO.	NAME AND RESIDENCE.
14	Victor H. Amberg, Battle Creek.
376	Axel F. Anderson, Sanilac Centre.
508	Harry W. Andrews, Detroit.
497	Ernest Anschutz, East Tawas.
494	William Royal Bacon, Sault St. Marie.
128	John H. Baker, Chauncey.
16	Anna M. Barbour, Clifford.
516	William Barth, Grand Rapids.
43	Lucian M. Beall, Richland.
533	Anson Bennett, Potterville.
317	Frederick W. Bertram Alpena.
509	Myron E. Bidwell, Dowagiac.
424	Ira D. Birdsall, Grand Rapids.
56	Don A. Blanchard, Perry.
165	Thomas G. Blanchard, Capac.
38	Horace E. Blodgett, Mason.
480	Louis E. Bockes, Central Lake.
502	Ben J. Bosma, Grand Rapids.
382	Almira C. Bradin, Lakeview.
504	Herbert Bradley, Williamston.
542	Edward W. Bromley, Detroit.
491	Charles W. Burdick, Flint.
158	Clarence Cameron, Flushing.
531	Floyd Chadwick, Muskegon.
503	Lewis E. Chappell, Grand Rapids.
407	Ward N. Choate, Jackson.
444	W. Lee Church, Flint.
22	Phoebe M. Cleveland, Nunica.
432	Alvin M. Cochrane, Detroit.
504	Albert Cole, Grand Rapids.
547	Frank Connell, Belding.
55	Harry J. Connell, Belding.
101	Johanna L. Connie, Wexford.
9	Earl C. Corey, Olivet.
276	Charles V. Craft, Flint.
377	Archie E. Crosby, Fairgrove.
163	Abel Cruson, Wheeler.
548	Charles W. Culbertson, Ridgeway.
450	A. Clement Davis, Grand Ledge.
126	Nathan N. Davis, Mattawan.
510	William D. Day, Belding.
198	M. Lafe Decker, Lacota.
473	William E. Decker, Saginaw.
336	Nick DeHass, Fremont.
536	Cornelius DePree, Holland.
212	William Devereaux, Carsonville.
89	Charles S. N. Dodds, Buchanan.
487	Harry Dolson, Saginaw.
535	Charles E Doyle, Middleville.
460	George E. Doyle, Detroit.
434	Thomas Dugan, Standish.
464	Peter John Dykema, Grand Rapids.
364	Herbert E. Earl, Albion.
320	Philip Eberstein, Scotts.
505	Charles T. Eckerman, Muskegon.
61	Rosa M. Eckerman, Muskegon.
216	Morris E. Elliott, Pontiac.
525	Ernest L. Erb, Coopersville.
124	Celia E. Ervey, Wheeler.
242	Charles K. Essler, Lansing.
426	Charles N. Evans, Detroit.
135	May Feighner, Muskegon.
333	George C. Fenton, Bailey.
205	Cornelius J. Fisher, Harrisville.
435	F. William Fisher, Windsor, Ont.
478	Frank M. Fisk, Edwardsburg.
485	Arthur B. Fleischer, Saginaw.
546	Edward J. Fletcher, Grand Rapids.
316	Otto L. Fluegel, Detroit.
524	Bion E Foley, Lakeview.
506	Harry Whitfield Fox, Muskegon.
174	George W. French, Sparta.
419	Hart P. French, Trenton.
537	John C. Furniss, Nashville.
141	Julia E. Fuller, Swartz Creek.
377	Fred W. Gallinger, North Branch.
486	Edward J. Gardner, Petoskey.
322	Matt J. Gillam, Kalamazoo.
4	Fred S. Gillett, Hillsdale.
28	James W. Godfrey, Freeport.
492	Elizabeth Golden, Fenton.
200	Burton A. Gordon, Battle Creek.
348	Alton W. Grandy, Dansville.
493	Charles L. Grube, Saginaw.
35	Met Gurnan, Detroit.
303	F. Hagerman, Birmingham.
140	Burr Haight, Bronson.
216	Helen S. Hale, Perrington.
112	Ora G. Hale, Harrison.
109	Sarah J. Hale, Ashley.
278	Edwin Hallowell, Flint.
441	Adelbert N. Harris, Detroit.
307	Albert N. Hawk, Remus.
469	Frank L. Hayes, Detroit.
549	Myron Norton Henry, Lansing.
5	Archie W. Herrick, St. Louis.
468	Henry A. Herzer, Saginaw.
309	F. William Heysett, Ludington.
397	Clara C. Hickey, Highland Park.
461	Charles F. Hicks, Pontiac.
7	Dayton W Higgens, Morley,
145	Frank L. Hoffman, Shelby.
365	John T. Holbrook, Coldwater.
213	Margaret J. Hollister, Detroit.
406	LeRoy Clark Horton, Midland.
40	Thomas A. Howard, Pontiac.
118	Alice A. Hudson, Marcellus.
474	Frank E. Hume, Owosso.
465	Ernest R. A. Hunt, Lowell.
452	Guy Huntoon. Adrian.
543	Henry J. Isbell, White Pigeon.
366	E. Adolphus Iveson, Detroit.
24	Lottie E. Jayne, Dewitt.
447	Ernest M. Jefferson. Battle Creek.
354	William R. Jewett, Grand Rapids.
310	Emil Johnson, Muskegon.
517	George Adelbert Johnson, Petoskey.
453	Horace G. Johnson, Lisbon.
518	Freeman A. Jones, Museegon.
511	Cornelius DeJonge, Zeeland.
519	Julius F. Kaeding, Detroit.
498	Theodore Karmsen, Greenville.
437	Fred H. Kelly, Detroit.
520	Richard E. Kincaid. Hersey.
488	Joseph S. Kirchner, Detroit.
476	Addison L Kirtland, Lakeview.
390	Sarah E. Kirtland, Lakeview.
100	Gustavus H. Knaak, St. Joseph.
468	William F. Knabb, Monroe.
422	John Knapman, Detroit.
330	Mary Kommran, Big Rapids.
65	Lawrence Kramer, Holland.
313	Henry M. Lamb, Detroit.
512	Frank Lane, Detroit.
222	Walter E. LeFevre, Muskegon.
528	Oliver B. Leonard, Grand Rapids.
157	Semour Levers, Eastmanville.
451	Jane R. Lewis, Otisville.
490	Henry B. Longyear, Mason.
530	John W. Loppenthein, Ludington.
340	David R. Low, Detroit.
539	William H. McAllister, Detroit.
248	George E. McAvoy, Muskegon.
526	Newell McDonald, St. Johns.
501	George H. McGillivray, Muir.
41	John F. McInerney, Wyandotte.
95	Archie Maclaurin, Manistique.
369	M. Seward McNitt, Byron Centre.
229	Robert Mann, East Tawas.
521	John J. Maser, Lansing.
116	Emma C. Mason, Ransom.
399	John Mastenbrook, Muskegon.
499	Bert E. Matthews, Detroit.
187	Joseph H. Matthews, AuSable.

CERT. NO.	NAME AND RESIDENCE.
538	Clarence N. Menold, Bangor.
417	Fred Mesick, Plainwell.
142	Will C. Mitchell, Ishpeming.
483	Uno Michael Montin, Hancock.
544	Frank A. Moon, Lowell.
57	M. D. Moore, Sanilac Centre.
235	Alfred A. Morse, St. Clair.
448	Benjamin L. Murray, Ypsilanti.
398	Robert H. Nelson, Ridgeway.
428	Adam Newell, Burnips Corners.
33	Dora A. Nichols, Bronson.
108	George W. Nichols, Ludington.
513	Omar A. Nichols, Battle Creek.
161	Clarence S. Norton, Killmaster.
371	Martin E. Olson, Big Rapids.
96	Matthew D. O'Meara, Hillsdale.
438	Charles L. Osborne, Vandalia.
59	Mary V. G. Osborne, Luther.
168	Stewart E. Padfield, Nanbinway.
312	Otto Pagelson, Grand Haven.
500	Wallie P. Payne, Hastings.
489	William T. A. Payne, Detroit.
380	Adolphus J. Peltier, Detroit.
1	Edward W. Pendleton, jr., Sturgis.
29	Mary Percell, Stevensville.
514	Artemus A. Perry, Girard.
550	Oscar Peterson, Muskegon.
466	Fred A. Pfannenschmidtt, Detroit.
117	Ellsworth H Phillips, Marcellus.
395	Henry S. Phillips, Carson City.
454	Edwin H. Pierce, Allegan.
192	Lewellyn D. Pollard, Pentwater.
129	George S. Preston, Columbiaville.
411	Halby Prosser, Bay City.
471	Herman F. Raible, Detroit.
224	Fred Ream. Detroit.
172	Charles L. Reed, Detroit.
20	Daniel W. Reed, Detroit.
480	Henry Reichel, Grand Rapids.
481	Thomas E. Reily, North Branch.
467	William A Repp. Detroit.
515	Moses E. Reusch, Ionia.
114	Martin G. Reynolds, Saline.
532	Paul F. Rice, Lennox.
52	Mary E. Richards, Manistee.
420	Vinton J Rickerd. Grand Rapids.
507	Harry Risinger, Cedar Springs.
470	Charles A. Robertson, Coopersville.
540	Simon D Roche, Concord.
529	Zimmerman Ross, Marlette.
36	Frank A. Sanford. Grand Rapids.
375	William S. Savage, Millington.
280	George W. Sayles, Port Huron.
446	Henry A. Schall, Three Rivers.
484	Henry M. Schall, Three Rivers.
458	Robert L. Schorr, Detroit.
545	Charles W. Schroeder, Menominee.
76	Henry J. Schuberg, Kalamazoo.
252	Richard A. Servis, Pentwater.
71	Henry Seymour, Detroit.
19	Maggie Shanahan Marine City.
482	Robert W. Shaw, Port Huron.
228	Fred E. Sherwood, Fowlerville.
85	George E. Shireling, Grand Rapids.
374	Floyd D. Simpson, Flint.
146	Osceola A. Sinclair, Ishpeming.
381	William S. Sloane, Newmarket, Ont.
170	Darwin D. Smith, Ithaca.
89	Edwin M. Smith, New York, N. Y.
421	Samuel R. Smith. Grand Rapids.
496	William E. L. Smith, Fenton.
472	Edwin M. Snider, Sunfield.
324	Victor E Spalding, Battle Creek.
268	Charles Spriggs, Detroit.
51	Lizzie M. Stark, Burlington.
77	M. William Stevens, Mt. Pleasant.
185	Charlie A. Stevenson, Muskegon.
551	Alexander Stewart, Windsor, Ont.
154	Frank H. Sumner, Detroit.
113	Alexander Sutherland, Huntington, Ore,
541	Lyman H. Taft, Lowell
414	Frank J. Temple, Ridgeway.
394	George W. Thayer, Minden City.
120	Martha S. Thorp, Harrietta.
160	George S. Tomlinson, Au Sable.
479	J. Harry Triece, New Buffalo.
131	Charles J. Trombley, Detroit.
477	Henry J. VanLoon, Detroit.
73	Dora Von Walthausen, Bay City.
159	Samuel F. Walt, Auburn.
431	Frank W. Walker, Terre Haute, Ind.
527	Cornelius N. Ware, Detroit.
62	John H. Watson, Ithaca.
27	Fred C. Webb, Ann Arbor.
412	Forest M. Webber, Detroit.
522	Fred Weinman, Lansing.
257	Bert E. Wellman, Battle Creek.
271	Alexander F Wetzel, Red Jacket.
63	Estelle E. Whipple, Detroit.
523	Claude E. White Lakeview.
391	Cass M. Wilkinson, Newburg.
70	Edward A. Wilson, Chicago, Ill.
456	Purvis S. Wilson, Detroit.
429	William Andrew Winters, Detroit.
106	Dewitt C. Wisner, Jonesville.
308	William Wooley, Dowington.
440	Addis Worden, Detroit.
193	Lemuel P. Wurzburg, Grand Rapids.
128	William N. Young, Homer.
223	Otis E. Younguist, Lisbon.
37	Delos Zaritz, Yale.
272	Carrie B. Zeran, Eastport.
475	John G. Zryd, Detroit.

ROLL OF MEMBERS

M. S. P. A.

Adams, H. M., Port Huron 1888
Aisenman, Wolf A., Oklahoma City, O.T. 1891
Akey, J. V., 114 S. Spring St., Los Angeles, Cal. 1885
Albright, John H., Colon 1889
Aldworth, F. G., Grand Rapids 1884
Allen, A. W., 410 Grand River Ave., Detroit 1888
Allen, Chalmers P 1891
Allen, Earl, Grand Rapids 1887
Alsdorf, F. M., Lansing 1883
Amberg, Isaac, Battle Creek 1886
Anderson, C. N., Detroit 1888
Anderson, Edwin S., 159 Jefferson Ave., Detroit 1888
Anderson, Ellery, Midland 1884
Anderson, Moxon, Midland 1884
Andrus, E. J., Utica 1886
Armstrong, R. S., Chelsea 1888
Arthur, Hiram, Dowagiac 1887
Atchinson, F. E, Gladwin 1888
Babbington, John, Corunna 1884
Bachman, M. H., Stanton 1883
Bailey, Dr. John R., Mackinac Island 1890
Bailey, M. G., Mackinaw Island 1888
Baker, H. G., T. H. Hinchman & Sons, Detroit 1888
Ballard, Edwin, Saginaw, W. S 1890
Bangs, W. Z., Grand Rapids 1885
Banister, George E., Utica 1889
Bannister, John L., 201 S. Washington St., Saginaw, E. S 1890
Barber, M. A., Petoskey 1887
Barie, H. L., Detroit 1887
Barnard, Wm. Dwight, Manistee 1891
Barrows, J. F., Lawrence 1885
Bartram, E. W., Paw Paw 1883
Bassett, A. 95 Woodward Ave., Detroit 1884
Bassett, J. A., Detroit 1885
Bauer, A. C., Grand Rapids 1884
Beach, L. T., Bay City 1884
Beachum, C. B., Romeo 1884
Beckwith, R. G., Bradley 1888
Beebe, Geo. C., 100 Harrison St., Bay City. 1890
Beeden, Bert N., Detroit 1889
Bell, Jno., Lexington 1888
Belsher, W. E., East Saginaw 1884
Bennett, C. W., Quincy 1888
Berridge, Chas. S., Orion, Oakland Co 1890
Bertram, J. P., Westphalia 1883
Bigelow, W. H., Owosso 1884
Blackmer, H. A., Charlotte 1884
Blair, C. A., Morenci 1885
Blakeslee, L. G., Detroit 1885
Blatchley, C. H., Manistee 1888
Bliss, Lyman W., Saginaw 1890
Borden, Edwin L., West Bay City 1890
Boehnlein, Geo., Williams, Davis, Brooks & Co., Detroit 1886
Bogart, Frank A., Detroit 1890
Bostford, E. S., Dorr 1886
Bostrick, J. C., Manton 1887
Bower, J. E., Crystal Falls 1887
Bower, Reuben T., Jr., Petoskey 1891
Boynton, Oliver C., Port Huron 1890
Brackett, F. E., Cheboygan 1887
Braden, Cyrus F., Lakeview 1890
Breitenbach, A. P., 99 Elizabeth St., Detroit 1889
Bricker, C. E., Port Huron 1888
Briggs, J. W., Schoolcraft 1883
Bristol, F. E., Lapeer 1884
Bristol, N. D., Lapeer 1884
Brooks, Alanson S., Detroit 1890
Bross, C. M., Jerome 1889
Brown, D. D., Kalamazoo 1895
Brown, H. J., Ann Arbor 1883
Brown, J. J., Okemos 1883
Brown, W. J., Detroit (?) 1888
Brundage, F., Muskegon 1886
Bruske, R., East Saginaw 1885
Buchanan, B. F., Harrisville 1883
Buchanan, B. S., 133 Woodward Ave., Detroit 1888
Buckham, B. J., Flint 1890
Bugbee, C. A., Cheboygan 1885
Burdick, H. H, West Bay City 1884
Burley, David H., 626 Water St, Port Huron 1890
Burroughs, C. S., Clinton 1884
Burwell, R. G., Fort Gratiot 1884
Cady, G F., Hart 1888
Caldwell, J. W., 242 Grand River Ave., Detroit 1884
Calkins, E. E., Ann Arbor 1888
Calkins, S. B., Charlevoix 1885
Campbell, J. E., 477 Grand River Ave., Detroit 1888
Carney, M. S., Decatur 1885
Caulkins, F. D., Bay City 1888
Chamberlain, G. T., Hartford 1883
Champney, W. R., 27 Lafayette Ave., Detroit 1883
Chandler, C. A., Cambria Mills 1884
Church, H. M, Holly 1884
Church, Wm. D., Detroit 1889
Clark, A. B., Gobleville 1889
Clark, A. G., White Cloud 1883
Clark, H. C., Detroit 1888
Clark, J. K., Blissfield 1884
Clark, S. B., Flint 1890
Claxton, W. C., Calgany, N. W. T., Can. 1885
Coe, T. D., Romeo 1884
Cohoe, Adolph, Capac 1890
Coleman, G. E., Elk Rapids 1885
Collins, A. B, Charlotte 1889
Collins, Jno. B., Frankfort 1888
Colman H. G., Kalamazoo 1884
Colwell, Dr. C. B., Jackson 1886
Conrad, J. F., Otsego 1886
Conway, V. R., Sault St. Marie 1885
Cook, C. E., 912 VanBuren St., Bay City. 1884
Cooper, J. S., Cheboygan 1885
Cornell, Aaron, Elkton 1890
Cornell, E. A., Elkton, Huron Co 1885
Cosford, J. W., Mancelona 1887
Craft, C. N., Flint 1890
Crawford, J. B., Detroit 1885
Cress, Edward A., Minden City 1890
Crispie, John, Plainwell 1886
Croman, Jas. M., 291 Woodward Ave., Detroit 1889
Crouter, G. W. Charlevoix 1883
Crowley, J. J., 421 Michigan Ave., Detroit. 1884
Culver, Dr. R. W., South Haven 1886
Cummer, R. J., 1116 Payne Ave., Cleveland Ohio 1884
Cunningham, A. R., 264 Jos. Campau Ave. Detroit 1891
Curran, E. S., St. Joseph 1883
Currie, A. A., St. Clair 1885
Curtis, C, A. Petoskey 1885
Curtis, F. E., Napoleon 1885
Curtis, W. H., Saginaw 1890
Cushman, H. D, Three Rivers 1884
Cutler, W. R., Ionia 1883
Damon, J. A., Millington 1884
Darling, G, S., Tawas City 1888
Davis, F. C., Sand Beach 1888
Davis, George S., Detroit 1886

Davis, Jas. E., Detroit....1884
Davis, T. W., 308 Woodward Ave., Detroit.1888
Dayton, A. J., 674 Wealthy Ave., Grand Rapids....1887
Dean, H. M., Niles....1887
DeBoe, John, Grand Rapids....1884
DeForest, George G., 374 Woodward Ave, Detroit....1890
Dennis, G. C., Rochester....1888
DePuy, C. E., Stockbridge....1888
Dewey, C. E., Napoleon....1885
Dewitt, P. A., Spring Lake....1888
Dillon, Jas. E., East Tawas....1887
Dodd, I. LeRoy H., Buchanan....1884
Dodds, John J., Detroit....1883
Dolsen, Henry, 200 North Hamilton St, Saginaw....1890
Dorman, Charles, Elkton....1890
Dorr, F. W., Manchester....1888
Dorrance, A. A., Coldwater....1888
Dullam, Frank, Flint....1890
Dullam, John C., Flint....1890
Dumond, G. W., Tuscola....1890
Dunbar. R. H., Parma....1885
Dunlap, Thomas, South Lyon....1884
Dunlop, J. W., Clare....1883
Dupont, William, 182 Michigan Ave., Detroit....1883
Eberbach, O., Ann Arbor....1883
Eberbach, Wm. F., Ann Arbor....1889
Eckerman, A., Muskegon....1884
Eldred, B. C., Chesaning....1885
Elfbrandt, Henry, Negaunee....1890
Elliot, R. H., Pontiac....1885
Empey, M. C., South Bay City....1884
Erwin, M. J., Harbor Springs....1887
Fairchild, H. B., Grand Rapids....1886
Farrand, J. S. jr., Detroit....1888
Fasquelle, L. J., Petoskey....1885
Fanckboner, Orin A., 180 Trowbridge St., Grand Rapids....1890
Fay, O. J., Carlton....1886
Fellows, C. A., Three Rivers....1884
Fenton, A. W., Bailey....1886
Fenton, George L., Kingsley....1885
Fildew, A. S., St. Johns....1884
Fincher, F. W., Pentwater....1883
Fisher, James, Marlette....1887
Fisk, C. A. E., Petoskey....1885
Foot, Wm. H., East Saginaw....1884
Foote, C. E., Jackson....1886
Fordham, M., Elmira....1885
Fordham, W. W., Elmira....1884
Forsyth, Edward L., Kalmazoo....1891
Foster, Albert, Benton Harbor....1890
Fox, J. R., Cedar Springs....1886
Frantz, Charles H., 416 Genesee Ave., Saginaw, E. S....1890
French, C. D., Hillsdale....1888
Frenzel, G. S., Mayville....1889
Fritz, T. H., Cass City....1885
Fuller, Fred R., Newberry....1890
Fuqua, C. B., Big Rapids....1891
Furniss, John C., Nashville....1891
Gallagher, Edward W., 2701 Washington Ave, Saginaw. E. S....1890
Gardner, A. R., Fowlerville....1884
Garner, Edward J., Canby, Emmet Co....1891
Garrigues, E. B., 410 Race St., Philadelphia.1889
Gates, Dr. T. O., East Tawas....1884
Gerow, J. E., Ovid....1883
Gill, W. J., Beacon....1884
Gladding, S. O., Constantine....1883
Gladwin, H. L. Merrill....1888
Glazier, F. P., Chelsea....1885
Gleason, E. G., Richmond....1884
Glover, J. H., 120 West Congress St., Detroit....1888
Goldsmith. S. S., Manistee....1885
Goodrich, L. A., Hillsdale....1884
Goodrich, L. C., Kalkaska....1888
Goodsell, A. A., Jasper....1884
Gould, Otis, Henderson....1888
Gover, G. H., Leaton....1884
Grandy, Francis, Fairfield....1885
Greenthal, Julius, 986 Michigan Ave., Detroit....1888
Griffith, W. F., Howell....1883
Griggs, S. A., Woodward Ave., Detroit....1869
Grossman, Wm, 1218 Court St., Saginaw, W. S....1890
Grunow, O. H., 189 Gratiot Ave., Detroit..1884
Gundrum, George, Ionia....1883
Hackett, P. E., Wolverine....1886
Haeussler, G. J., Manchester....1885
Hagerman, F. Birmingham....1886
Halght, A. L., Woodland....1886
Haines, Edwin J., Sandusky, Ohio....1890
Hale, H. G., Nashville....1883
Hall, George C., 118 West Congress St., Detroit....1888
Hall, W. A., Greenville....1884
Hamilton, E. A., White Pigeon....1886
Hamlen, R. J., 813 Gratiot Ave., Detroit...1885
Harper, J. C., Milan....1884
Harrison, H. E., Richmond....1884
Hart, Austin P., Mulliken....1891
Hartz, H. J., Detroit....1884
Harvey, S. K., Detroit....1884
Harwood, G. M., Petoskey....1884
Harwood, Henry, Ishpeming....1885
Hawkins, A. H., Clayton....1888
Haynes, D. O., 895 Jefferson Ave., Detroit.1886
Heath, Fred, Hastings....1884
Heimbach, S. J., Constantine....1884
Heysett, Wm., Ludington....1885
Hicks, C. F., Pontiac....1891
Hicks, Chas. V., Oscoda....1891
Hicks, W. H., Morley....1883
Hinchman, C. C., 76 Jefferson Ave., Detroit....1885
Hinchman, J. M., 76 Jefferson Ave., Detroit....1888
Hinchman, Theo. H., 76 Jefferson Ave., Detroit....1888
Hinds, E. J., Midland....1886
Hisner, H. C., Woodbridge and Third Sts., Detroit....1888
Hodges, F. A. Parma....1888
Holland, Marion, M. D., Edwardsburg....1890
Holton, Samuel M., Battle Creek....1890
Hopkins, F. S., Benton Harbor....1888
Hopkins, T. F, Muskegon....1884
Hotchkiss, F., Hastings....1884
Hubert, John H., Saginaw, E. S....1890
Hudnutt, F. O., Hanover....1888
Hueston, G. C, Northville....1885
Hull, C. W., Bay City....1876
Humburg, Fred, 934 Gratiot Ave, Detroit.1888
Humeston, Bishop, Jackson....1890
Hunt, A. O., St. Johns....1885
Hunt, DeWitt H., St. Johns....1888
Hurd, A. E., Davison Station....1884
Hutchings, William, Leslie....1884
Hutchins, Lee M., Detroit....1890
Hutton, R. J., 425 Antoine St., Detroit....1885
Huyck, E. E., Clio....1888
Hyde, A. O., Marshall....1883
Hynes, Quincy, Delton....1885
Inglis, Frank, Detroit....1883
Ingram, E. J., Iron Mountain....1883
Ingram, F. F., Detroit....1891
Jack, G. T., Detroit....1890
Jackman, W. F., 287 Michigan Ave., Detroit 1888
Jacobs, Henry jr., Constantine....1890
Jamison, T. A., South Boardman....1886
Jebb, Edward R., Climax....1889
Jesson, Jacob, Muskegon....1883
Jones, Frank E., 453 S. 5th St., Saginaw..1890
Jones, M. A., Marquette....1888
Jones, Shelby B., Greenville....1890
Johnson, J. G., Traverse City....1884
Johnson, O. C., Ann Arbor....1884
Johnson, Sterry A., Ogden Center....1890

mson, Wm., jr., 121 Jefferson Ave,, Detroit....1888
mson, William C., 120 W. Congress St., Detroit....1888
hon, F. E. Brighton....1888
ks, Harry, Chicago....1891
ly, F. H. Au Sable....1884
mink, Theo., 81 W. Leonard St., Grand Rapids....1884
mody, E. J., 709 Woodward Ave., Detroit....1884
mody, T. B., Commerce....1886
phart, H., Berrien Springs....1888
phart, W., Berrien Springs....1884
stell, J. R., 695 Beaubien St., Detroit....1887
utz, Carrie B., Carleton, Monroe Co....1890
mball, J. L., Crystal Falls....1884
mgley, John, Manistee....1889
mmont, B. F., Tekonsha....1884
rby, Clarence D., Leslie....1890
rkwood, C. H., Ishpeming....1884
rkwood, P. B., Negaunee....1885
ngman, Theo., Dexter....1885
ll, H. C., Jr., Port Huron....1888
n, C. S., Muskegon....1885
mer, Charles F., 416 Genesee Ave., Saginaw, E. S....1890
croix, Jos. J., Bay City....1890
mbert, B. L., 185 Jefferson Ave., Detroit....1884
me, I. D., Sand Beach....1884
ngenman, Fred E., Saginaw, W. S....1890
Rue, C. M., West Bay City....1885
ilmer, F. N. Ludington....1888
ubengayer, T. A., Owosso....1884
w, Dr. W. J., Leroy....1889
e, John, M. D., Dexter....1884
sland, N. P., Gaines....1886
ntz, Theo., Campbell Ave., Detroit....1885
rver, Henry, Newaygo....1884
yerer, George S., Bay City....1890
Hommedieu, F. C., 95 Woodward Ave., Detroit....1888
tchfield, E. C., Flint....1885
ttle, A. F., Aarwood, Kalkaska Co....1885
ocher, H. E., Grand Rapids....1885
onsbury, Abram D., Midland City....1890
onsbury, P. M., Reed City....1885
owman, Dr. Oscar, 185 Jefferson Ave., Detroit....1889
nce, W. O., jr., Caro....1885
nn, G. D., Edmore....1885
ns, G. L., West Bay City....1886
yman, A. H. Manistee....1883
yman, Dr. M. R., Gagetown....1891
yons, A. B., Honolulu, S. I....1884
cCullough, Edward P., care Fred D. Stevens, Detroit....1890
cDonald, D., Kalamazoo....1884
cDonald, D. T., Red Jacket....1883
cEvoy, J. E., Manistee....1885
cFarland, A. E., 698 Michigan Ave, Detroit....1883
cGee, Thomas H....1891
cKenna, J. D., Shepherd....1884
cKibbin, R. S., 322 Fort St., W., Detroit....1888
cMillen, Walter R., 726 4th Ave., Detroit....1890
cMullen, G. H., Ionia....1883
cMurtie, Fred J., Three Rivers....1889
acKimmie, J. D., 28 Jefferson Ave., Detroit....1888
almgren, Gustav A., Iron Mountain....1887
andigo, Della, Sherwood....1886
ann, Albert, Ann Arbor....1883
ann, Chas. F., 845 3rd Ave., Detroit....1888
artin, A. F. Imlay City....1884
artin, C. L., Elk Rapids....1884
artin, Henry, Jackson....1884
artin, Susie A., Hopkins Station....1885
arty, F. O., Bay City....1887
ason, C. A., Flint....1885
ason, G. B., Saline....1883
Mason, J. F., Warren....1888
Matthews, George McD., Chase....1891
Maxson, M. M., Hudson....1885
Mayer, F. W., Sebawing....1884
Merrell, F. P., Ithaca....1883
Merriam, Chas. H., Jackson....1890
Merrill, A. C., Harbor Springs....1887
Meseroll, D. C., Jackson....1884
Mesick, H. J., Plainwell....1886
Miller, Archie T., Swartz Creek....1890
Miller, H. J., Vassar....1885
Milliken, T. J., St. Clair....1884
Mills, L. M., Grand Rapids....1886
Millspaugh, Martin Benedict, 28 Packard St., Grand Rapids....1890
Moeller, Jos. C., 74 Joy St., Detroit....1889
Moore, John, Ann Arbor....1884
Moore, Lou G., Saginaw, W. S....1890
Mooreland, Charles, Hadley....1885
Morris, H. M., 919 Grand River Ave., Detroit....1888
Morris, S. S., Pinconing....1888
Morrison, A. W. Constantine....1885
Muir, J. D., Grand Rapids....1886
Murphy, J. W., Battle Creek....1883
Myers, A. W., Gobleville....1884
Myers, Theo. W., Saginaw....1890
Nash, C. P., T. H. Hinchman & Sons, Detroit....1884
Nasmyth, P. F., 388 Baker St., Detroit....1886
Nelson, E. H., 118 West Congress St., Detroit....1884
Newell, C. P., Flushing....1884
Niven, Mrs. W. H., Chesaning....1888
Noel, Gideon, Good Hart, Emmet Co....1884
Northrup, B. D., North Lansing....1893
Nugent, W. A., Alpena....1891
Nutt, E. C., Cheboygan....1890
O'Brien, J. R., 297 First St., Detroit....1885
Orr, E. N., Manistique....1886
Orr, J. J., Tecumseh....1884
Orth, L. P., Traverse City....1886
Osborne, G. A., Luther....1887
Packard, Homer H., Cheboygan....1890
Palmer, Dr. Henry, St. Johns....1889
Parker, A. S., 747 Woodward Ave., Detroit....1883
Parker, G. J., Port Huron....1883
Parker, O. J., Howell....1886
Parkill, C. P., Owosso....1883
Parkill, S. E., Owosso....1883
Parkinson, E. A., Grand Rapids....1885
Parquette, F. D., Ludington....1883
Parsons, Chas. W., 99 Woodward Ave., Detroit....1890
Passage, J. H., Greenville....1886
Patenaude, A. Norway....1887
Patterson, B. M., 238 Randolph St., Detroit....1885
Pauly, L., St. Ignace....1887
Peck, A. W., Petoskey....1888
Peck, J. E., Grand Rapids....1885
Peckham, H. C., Freeport....1885
Pegg, H. D. Morenci....1884
Perham, Jason, Kent City....1888
Perry, D. B., West Bay City....1883
Perry, F. W. R., 709 Woodward Ave., Detroit....1883
Pettitt, Charles E., Bad Axe....1890
Phelps, L. A., Saugatuck....1888
Phillips, E. F., Armada....1883
Phillips, F. S., Ogden....1884
Phillips, H. S., Carson City....1888
Phillips, W. R., Battle Creek....1883
Pierson, L. R., Des Moines, Ia....1888
Pike, N., Morley....1888
Piper, Fred H., 717 Ionia St., Lansing....1889
Platts, Randolph, Port Sanilac....1884
Powell, A. H., Gladstone....1890
Power, J. O., Addison....1884
Prall, D. E., East Saginaw....1883
Pratt, J. O., 723 Antoine St., Detroit....1884

Pratt, Stephen, Howell....1885
Prescott, A. B., Ann Arbor....1883
Purvis, J. S., 983 Jefferson Ave., Detroit..1885
Raider, J. F. A., Newaygo....1883
Raison, Jas. Wakefield....1888
Randolph, A. M., Northville....1883
Ray, G. C., West Bay City....1885
Raymo, Owen, Wayne....1888
Raynale, Frank B., 32 Woodward Ave., Detroit....1891
Reidy, Mike, Corunna....1884
Revell, Samuel, Roscommon....1888
Reynolds, Lenton E, Adrian....1890
Reynolds, W. B., Charlotte....1883
Rice, C. E., Lenox....1888
Rich, John W., Manistee....1885
Richards, F. P., 204 Jos. Campau Ave., Detroit....1885
Richards, T. H., 780 Jefferson Ave., Detroit....1884
Richmond, T. W., Bear Lake....1888
Riggs, Miles E., Cheboygan....1891
Ringler, Eugene, Saginaw....1884
Ripley, L. G., Montague....1884
Roberts, D. O. Kalamazoo....1887
Robertson, B. J., Breedsville....1884
Robinson, E. H., 2399 St. Catherine St., Montreal....1888
Rodenbaugh, H. W., Breedsville....1887
Rodenbaugh, J. N., Marcelona....1886
Rodenbaugh, O. L., Mancelona....1884
Rodgers, E. J., Port Huron....1884
Roeser, Otto W., Saginaw, W. S....1890
Rogers, Arthur S., Vassar....1889
Ross, E. W., Detroit....1884
Roussin, V., Ludington....1884
Rudolphi, A. E., Dowagiac....1886
Rundel, J., Holton....1886
Runner, J. W., Shelby....1886
Russell, Ellsworth E., Jackson....1890
Sackett, S. M., Monroe....1883
Sanford, Frank A., Grand Rapids....1889
Safford, O. P., Flint....1883
Sawyer, R. J., Menominee....1883
Sayers, J. A., Seney....1885
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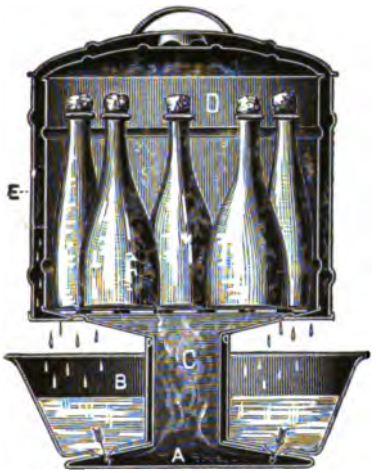
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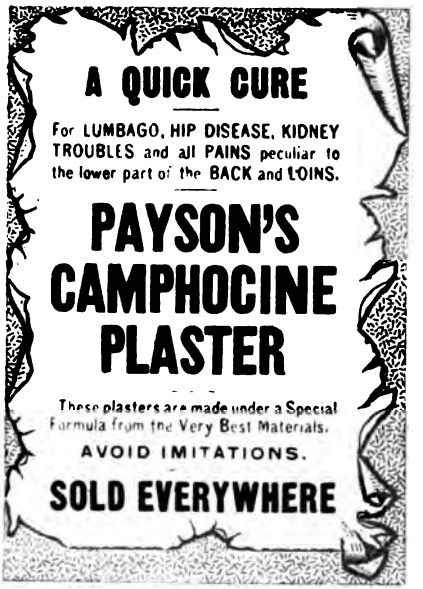
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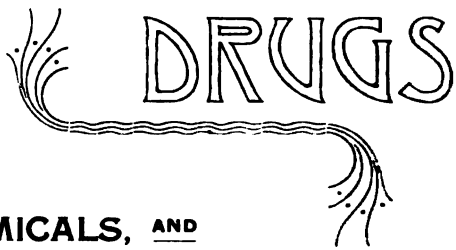
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AMMONIACAL GLYCYRRHIZIN (Sugar of Licorice), in Scales.

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Supplied by the Mallinckrodt Chemical Works, St. Louis, in beautifully white anhydrous Crystals is *absolutely pure* and *unsurpassed* by *any brand* in the market. Always specify "*Mallinckrodt's*" and get *the best.*

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It contains much of Interest to Druggists, Drug Clerks, and members of the Retail, Wholesale and Manufacturing Branches.

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3—Manufacturers, Etc.
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SOLD ONLY TO DRUGGISTS.

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FORMULA, EDWIN F. RUSH, M. D.

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℞ Ext. Trifolium Co.—Merrell.....Four fl. ounces.
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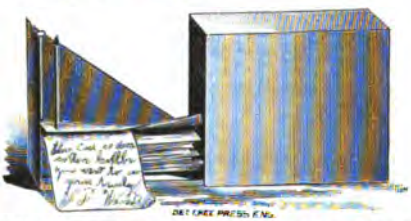
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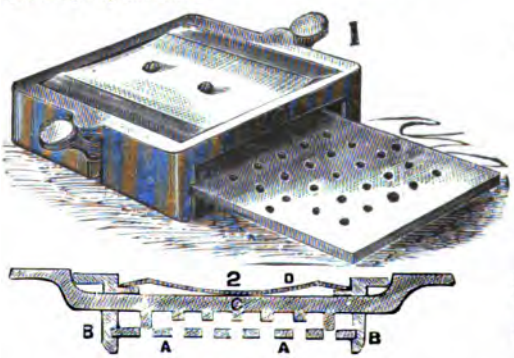
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WHAT PREPARATION OF MALT WITH COD-LIVER OIL SHOULD BE PRESCRIBED AND DISPENSED?

The earnest attention of pharmacists is invited to demonstrated facts regarding the quality of the preparations of malt with cod-liver oil in the market, determined by the report of the chairman of Committee on Adulterations, of the New York Pharmaceutical Association, read at the recent 1891 meeting.*

Dr. Eccles analyzed the three best known preparations of cod-liver oil in the market, number one, Trommer's; number two, The Maltine Co.'s; number three, Parke, Davis & Co.'s, and reached the conclusion already arrived at by an analysis previously made of these same products by Prof. R. H. Chittenden, of the Sheffield Scientific School of Yale University, that only one of these products, and that number three, was true to the claim made by its makers as to the percentage of cod-liver oil.

We quote verbatim from Dr. Eccles' report, as follows:

"There are but three well known makers of this preparation, and the variation in its title renders it impossible to conceal their identity even if deemed necessary. A bottle of each was purchased in the open market, and submitted to examination for the purpose of ascertaining the per cent. of oil. A rumor being afloat of some departure from honorable dealing in the composition of two of these products, spicy revelations were anticipated, and we have not been disappointed. When a chemist seeks sophistication in a food or medicinal product, he never expects to find a dear article used to adulterate a cheap one. If dame rumor can be credited, something like this has been laid at the door of two manufacturing establishments. What is very amusing about the matter is, the fact that one firm insists upon the truth of the charge, although our analysis acquits them of such singular conduct. Cod liver oil is cheaper than malt extract, so that the substitution of the latter for the former could not be deemed an act of economy by any one. Every preparation should be true to its claim, whatever the cost of the respective ingredients. If a false sentiment has gone abroad among medical men, to attempt to cater to this sentiment verbally while contradicting it practically, is, to say the least, bad policy.

One of your committee has practically found that phthisical patients do well on this preparation when the proportion of oil is small, if not too small, while they do not do so well on those goods having the greatest per cent. of oil. This has been put to the test since the present examination began. Full doses, where the quantity of oil is large, were found to annoy the patient through regurgitation, whereas the smaller proportion was at once assimilated.

The label on number one claimed a composition of 40 per cent. of oil and 60 per cent. of extract. It is therefore nearly 25 per cent. short of its own claim."

Inasmuch as the chemist of the State Dairy Commissioner of Ohio, about a year ago made a report not in harmony with these facts, which report the Trommer Co. made use of to depreciate Parke, Davis & Co.'s preparation of malt with cod-liver oil, and widely circulated with the intent of disparaging this product and advertising their own, it gives us much satisfaction to quote the opinions of these two distinguished chemists, Professors Chittenden and Eccles, in substantiation of our claims, and desire to inform their friends among the medical and pharmaceutical professions that our product has sustained its reputation for excellence, and to request physicians and pharmacists to specify it in their orders in preference to that of other manufacturers.

A complete copy of Prof. Eccles' report will be sent on application to Parke, Davis & Co.

---

*Report of Prof. Robert G. Eccles, M. D., Government Chemist for the Inspection of Medical supplies for the Department of the Interior, Official Chemist of the United Retail Grocers' Association of Brooklyn, Chairman of sub-committee on the Pharmacopœia, Member of the Executive Committee of the Chemical Section of the Brooklyn Institute, Ex president of the New York State Pharmaceutical Association, Honorary Member of the California College and State Pharmaceutical Association, and of the oldest State Pharmaceutical Association of the Nation, that of New Jersey.

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Above Goods are Recommended to the Drug Trade as Far Superior to the Ordinary "Stuff" Sold.

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DETROIT.

PROCEEDINGS

OF THE

MICHIGAN STATE

PHARMACEUTICAL ASSOCIATION

AT ITS

TENTH ANNUAL MEETING

HELD AT

GRAND RAPIDS

Aug. 2-4, 1892

ANTISEPTICS AND DISINFECTANTS

FOR THE PREVENTION OF CHOLERA.

THE prevention of disease is the unselfish mission of the modern physician. Antiseptics and disinfectants to-day occupy the first place in medical and surgical practice.

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TABLETS OF YELLOW OXIDE OF MERCURY, containing two hundredths of a grain of the oxide, are a valuable prophylactic against dysentery and enteric fever. They prevent fermentation and putrefaction, and render aseptic the alimentary tract.

CHLORANODYNE is a combination of anodynes, antispasmodics, and carminatives which has been largely employed in gastric and intestinal troubles. It acts very happily as an anodyne and as an astringent in cholera, dysentery, diarrhœa, and colic.

ANTISEPTIC LIQUID arrests decomposition and destroys noxious gases that arise from organic matter in sewers and elsewhere, and may be used in cellars, barns, outhouses, and the sick room.

ANTISEPTIC TABLETS are convenient for the extemporaneous preparation of antiseptic solutions of definite strength for disinfectant purposes and for antiseptic sprays.

DISINFECTANT POWDER possesses in a high degree disinfectant, absorbent, and antiseptic properties. It is admirably adapted for the disinfection of excreta in cholera, yellow fever, and typhoid fever.

SULPHUR BRICKS are effectual in the fumigation and disinfecting of rooms after infectious diseases.

ETHEREAL ANTISEPTIC SOAP (Johnson's) was devised by an experienced nurse in the surgical clinic of the Jefferson Medical College. Its marvelous cleansing powers make it a valuable adjunct to the armamentarium of the physician and surgeon. Mercuric Chloride can be dissolved in it in ordinary proportions.

We shall be pleased to forward on request, any information desired concerning these products.

PARKE, DAVIS & CO.,

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PROCEEDINGS

OF THE

MICHIGAN STATE

PHARMACEUTICAL ASSOCIATION

AT ITS

TENTH ANNUAL MEETING

HELD AT

GRAND RAPIDS, AUGUST 2, 3, AND 4, 1892

ALSO, THE

CONSTITUTION AND BY-LAWS, ROLL OF MEMBERS, ETC.

BATTLE CREEK, MICH.
REVIEW AND HERALD PUBLISHING CO.
1892

NOTICE.

MEMBERSHIP.

Blank applications for membership will be furnished by the Secretary upon request.

Attention is called to the change in Article II of the By-laws, whereby applicants for membership are elected by the Executive Committee.

PROCEEDINGS.

Extra copies of the proceedings can be obtained of the Secretary at fifty cents each.

N. B.—If you change your residence, if your name or address is incorrectly given in the Membership Roll, or if you learn of the death of a fellow member, please notify the Secretary at once.

The next annual meeting of the Association will be held in June, 1893, at one of the resorts along the St. Clair River, the exact date and place to be fixed upon later by the Executive Committee.

CHAS. W. PARSONS, Secretary,

Box 583, DETROIT, MICH.

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For place and date of meetings for the examination of candidates, or other information, apply to

JAMES VERNOR, Secretary,
Detroit.

PROCEEDINGS

OF THE

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION.

MEETING HELD AT

Grand Rapids, August 2, 3, and 4, 1892.

FIRST SESSION.

THE Association was called to order at 2 o'clock P. M., August 2, by the President, Mr. H. G. Colman, who introduced Mr. Taylor, the City Attorney of Grand Rapids. Mr. Taylor welcomed the Association to the city in a brief address, and at the request of the President, Mr. Arthur Bassett responded in behalf of the Association.

The President then called to the chair Mr. Parkill, First Vice-President.

Mr. Parkill: The Association will now listen to the address of the President.

President Colman then read his address as follows:—

PRESIDENT'S ADDRESS.

We have again met to consider the work of our Association and the needs of our profession. Since our last meeting no great changes or new developments have occurred. There has been no session of our State Legislature to inspire us with either hope or fear. Our Secretary, Mr. Parsons, has made an early and earnest and persistent effort to develop among our members an interest in the Association which should result in increased work, and also to develop among the druggists who are not members of our Association an interest which should give us increased membership. How successful these efforts have been, the reports of our officers and committees will show. So far as I know, everything remains about as it was last year. It has seemed to me to be an unusually uneventful year. Possibly that is due in a measure to the fact that we are holding our annual meeting two months earlier in the season than usual, and that, consequently, the past year has been a short one.

There are two subjects which are always with us, and which, during the last few years, have been the principal sources of annoyance and of loss to druggists. They are the supplying of physicians by houses outside of the drug business, and the cutting of prices of proprietary articles. These evils still exist. They have diminished in some places, they have increased in other places. Druggists are still asking if this Association cannot protect them against these evils. It is safe to predict that these subjects will always be before us. Regarding the first one, I think that there is nothing which we, as an Association, can do. The physician has an undoubted right to buy his supplies wherever he pleases, and there will always be traveling salesmen who will represent to physicians that they can give them advantages which their home druggist cannot or will not give them, and there will always be physicians who will believe them, and there will always be towns in which such statements will be correct. I am constrained to repeat what I have said in some of our previous meetings, that I am convinced that the only remedy for this lies with the druggist. If he keeps an inadequate

stock, or if he is so poor a salesman or so lazy a salesman that he will permit an outsider, a stranger, to come into his town and sell his trade, he has no one to blame but himself. While, therefore, it may be proper and profitable for us as druggists to compare ideas as to how we can clear away misapprehensions which, no doubt, exist in the minds both of physicians and of druggists regarding each other, how we may create a stronger sympathy and an identity of interest between the two professions, I do not believe that it is a matter in which we as an Association have, or can have, anything to do.

In the matter of cutting of prices I believe that we may do something. In his address at our last annual meeting President Prall read a resolution which had been passed by the American Pharmaceutical Association, inviting the presidents of the State associations each to send a delegate to the meeting of the National Wholesale Druggists' Association to confer with that body, and with a committee from the American Pharmaceutical Association regarding a plan for relieving the retail drug trade from the disastrous effects of price cutting on proprietary articles. Mr. Prall stated that in response to that invitation he had appointed Mr. Arthur Bassett to be such delegate, and that Mr. Bassett was, at that time, attending the meeting of the Wholesale Druggists' Association in Louisville, Ky. Mr. Bassett will, during this session, give us a report from that meeting. It appears to me that we may be sure that the proprietors of proprietary medicines and the wholesale druggists are all of them interested in protecting us in the matter, and that systematic, persistent, and united effort on the part of a majority of the retail drug trade will surely bring us relief and protection from cutters.

I say a majority of the retail trade; we cannot at first get unity of action from all retailers. There are among them some "dogs in the manger" who delight in doing business for nothing and in making others do likewise; and for some time to come we shall find "traitors in the camp." But I believe that a majority will stand by each other, enough to in time bring the others into line.

While I do not wish to anticipate or to in any way interfere with our Committee on Trade Interests, I would recommend that at this session measures be taken looking to the organizing of all the druggists in Michigan, whether members of this Association or not, in an effort to do away with cutting, unless it shall seem to us that what we did last year in giving our Committee on Trade Interests special authority in this matter is sufficient.

There is a question, an old one, which demands careful consideration from us all. How can we interest more of the druggists of Michigan in the Michigan State Pharmaceutical Association? We believe that the Association is a good thing for us, that we derive benefit from it, and also that as a means of protection it is wise and prudent for us to keep up the organization and to keep it in good working order. How can we make others believe this? How can we reach those druggists who are so busy and so absorbed in their business that they think that they have no time for anything, either scientific or social? How can we reach that other class who are not so very busy about anything, but who have been jogging along in old ruts so long that they are satisfied with humdrum and routine? How can we inspire all these with a desire for improvement and growth professionally as well as financially and persuade them that they can find such improvement and growth in the Association? I trust that many of us will try to answer this question. I suggest that a revival of the question drawer, which during the last few years has fallen into comparative disuse, would greatly help to make our meetings interesting and profitable to the average druggist.

I have often heard druggists deplore the decline of their prescription business. Often they are at a loss to account for it. They cannot understand how a busy physician can have the time to compound his own prescriptions and do it accurately.

The explanation lies in the fact that we are living in what may be styled the ready-made age. The blacksmith no longer forges his own horseshoes or his own nails. He buys ready-made shoes and ready-made nails. Most shoemakers are simply cobblers. The dealer in ready-made shoes keeps ten times as many lengths, widths, etc., as he did twenty years ago. The grocer, in place of the single article of crackers, now displays a large variety of ready-made baker's goods. In place of codfish and herring he displays a full variety of canned

meats. He crowds hard on the butcher, the baker, and, for aught I know, on the candlestick maker. Even our newspapers, a majority of them, by the boiler plate process, are made up and edited by machinery.

The old-time wheelwright or wagonmaker, who used to be a man of marvelous genius, no longer shaves out felloes, bores hubs, makes axles, or anything else. He gets his wheels ready-made from one source, the other parts each from its own source, and then he simply puts them together. And unless he undertakes to put an inch and a quarter hub on an inch and a half axle, he gets along all right.

To a great extent the same is true of pharmacy, or, more properly speaking, the drug business. It could hardly be expected that this business would be an exception to a rule so universal. Our shelves are loaded with ready-made, machine-made prescriptions. Compare a catalogue of Tilden or Thayer of twenty-five years ago with one of Parke, Davis & Co., of the present day. We now seldom get out our pill tiles. Few are the emulsions that we make. The physician can find compounds in various forms and in endless combinations, proportions, and sizes. And, although at times none of them exactly fit him, still some of them come so near that the physician may be tempted to "make them do," and sometimes, perhaps, he yields to that temptation.

Therefore, just as a very ordinary mechanic, who could not possibly make a wheel or an axle, can quickly "set up" a whole wagon, so a physician who is a very ordinary pharmacist, though perhaps a good physician, can dispense his own medicine with small outlay of skill or time. And if sometimes he does try to fit a 1–40 grain dose to a 1–50 grain patient, no one knows it but himself.

I am glad to believe, however, that there is an improvement in this respect, that a reaction is setting in. There is a disposition among physicians to do their work more deliberately, even if they do less, that means doing it better. Some of them, at least, instead of congratulating themselves on the number of calls that they make in a day or the number of nights when they have been called up, consider rather the success of their work. They thus have time to study their cases more carefully and to adjust their remedies more accurately. Wherever this is the case, the services of the skilled pharmacist are required, and prescription writing and compounding are revived, provided always that the "skilled pharmacist" is at hand.

Let us, therefore, keep our tools in order and our "hands in," and not let our profession degenerate into the mere handling of proprietary articles, or even into the mere counting or measuring of ready-made pills, elixirs, syrups, etc.

A movement has been started by the State Association of Iowa looking toward having the Associations of the various States hold their annual meetings for 1893 at Chicago, in the buildings of their respective States, and at the same time, and the holding of union meetings of the entire Association of delegates for securing union of action on points like price cutting, etc., which interest the retail drug trade generally. I think the idea is a good one.

I hope that we may have a session in every way profitable; that there may be a free interchange of ideas which shall help to bring about the relations which should exist between our profession and the various kindred interests.

On motion of Mr. Bassett, of Detroit, the address of the President was referred to a committee to be appointed by the Chair, for revision and report.

The Chair then appointed as such committee, Mr. Bassett, Mr. Wurzburg, and Mr. Webber.

The President then resumed the chair.

President: The next business in order is the presentation of names of applicants for membership. We will listen to the report of the Executive Committee upon applications.

Secretary Parsons: The chairman of that committee desires to have the matter of applications held over until to-morrow's session if possible. I can report the number of applications

which have come in up to date, but I think there will be quite a number of others, and we prefer, if it is the will of the Association, to submit all the names at one time, to-morrow morning.

Mr. Parkill: It occurs to me that there may be some here, who have presented their applications, who would feel more at liberty to act upon matters of business if their names were acted upon now.

Mr. Parsons: According to the rule adopted a year or two or more ago, the Executive Committee during the year have passed upon certain applicants, and the names of such will appear in the regular report of the Secretary. I have had handed to me within the past hour the names of the following gentlemen who desire to become members: Mr. Geo. A. Price, Spring Lake, Mr. Chas. H. Bostick, Manton, William Remus, Pontiac, Mr. D. M. Russell, Grand Rapids, Mr. W. S. Winegar, Lowell, Mr. J. M. Woolcott, Grand Rapids. These names have not yet been acted upon by the Executive Committee.

President: Is there any action the Association cares to take with reference to these applications?

Mr. Parsons: I think it is the regular custom, if there is no objection, to accept as sufficient the signatures of the Executive Committee who are appointed to look into the matter, and that would be sufficient for their election, or do we require a vote of the Association?

President: I am not sure about that.

Mr. Wurzburg: It has been customary for the Secretary to cast a ballot for them unless there is some objection.

Prof. Prescott: I move that the Secretary be directed to cast the ballot for these applicants.

The motion was put and prevailed, and the applicants were declared duly elected.

Mr. Parsons: If it be your pleasure, I will read the names of a number of applicants who have been accepted by the Executive Committee during the past year.

Charles E. Smith, Pontiac, Adolphus O. Speckhard, Watersmeet, C. B. Fuqua, Big Rapids, Austin P. Hart, Mulliken, F. K. Stearns, Detroit, Barzilla S. Hutchinson, Ionia, Walter K. Schmidt, Grand Rapids, James W. F. Summers, Gould City, Harris E. Allen, Morenci, Benjamin Schrouder, Grand Rapids, J. D. Hamilton, Paw Paw.

President: Has the Executive Committee any other report to make?

Mr. Wurzburg: Not at present.

President: The next business in order is the

REPORT OF THE SECRETARY OF THE STATE BOARD OF PHARMACY.

Mr. James Vernor, the Secretary of the State Board of Pharmacy, then submitted the following report: —

To the Michigan State Pharmaceutical Association:

GENTLEMEN: In compliance with the law, I have the honor to submit herewith, the annual report of the Michigan Board of Pharmacy, for the fiscal year ending July 7, 1892.

The Board has found it necessary to hold two extra meetings during the past year, for the purpose of examining candidates for registration, owing to the increased number presenting themselves.

The Board have examined 375 applicants for certificates as "Registered Pharmacists," and 36 for those of "Registered Assistant Pharmacists," granting certificates to 164 of the former, and to 84 of the latter, the apparent excess in the number of the latter over the number examined for such certificates, being due to a rule of the Board, under which "Assistants'" certificates are granted to those who desire them among the class, who, failing to pass a full and satisfactory examination, yet pass sufficiently high to warrant the Board in issuing them certificates as Assistants.

The Board has received and disbursed monies during the year as follows:—

RECEIPTS.

From reserve fund in the State Treasury	$1,500 00
From 2,873 renewals of certificates at $1	2,873 00
From 218 " " " at 50 cts	109 00
From 293 applications for examination at $3	879 00
From 98 " " " at $1	98 00
Total	$5,459 00
Disbursed as per accompanying vouchers	3,704 81
Cash in the hands of the Board's Treasurer	1,754 19
Cash in the State Treasury	2,717 66
Total	$4,471 85

The Board in its last annual report gave the number of Pharmacists and Assistants registered in the State, as,—

	Pharmacists.	Assistants.
Highest register number July 7, 1891	3628	551
Dropped from the rolls	677	282
In force July 7, 1891	2951	269
Added during the year	164	84
	3115	353
Dropped during the year	82	67
In force July 7, 1892	3033	286
Dropped to date	759	349
Highest register number July 7, 1892	3792	635

There have been 78 complaints received during the year, for violation of the Pharmacy Law, which number added to those previously reported, makes the total number to date 368.

There are two cases in the hands of our Attorney at the present time. The Attorney has secured eight convictions during the year, making the total number to date 58; the total cost of this work has amounted to $4558.30, the fines aggregating $701.

Herewith please find a complete list of the names of those persons who are registered in the State of Michigan under the law whose certificates are in force at the present time.

Very respectfully submitted,

Detroit, July 7, 1892. JAMES VERNOR, *Secretary.*

On motion of Mr. Parkill, the report was received, and ordered placed on file with the Secretary.

President: The next business in order is the reading of papers. I believe Prof. Prescott has something prepared for us.

Prof. Prescott: Upon the part of the Committee on Queries I would like to inquire whether there are readers of papers present, of which papers the Committee has not yet been notified?

I hear no response, and I presume, therefore, that the Committee already has notice of such papers as are before the Association.

I have here several articles, illustrating some of the points in the papers, which you are at liberty to examine.

I have here what is entitled

"A Review of the Contributions of the School of Pharmacy of the University of Michigan for the Years 1891–1892."

[See Appendix for this Report.]

After the reading of the paper relating to tea and coffee, there was the following discussion:—

Mr. Parkill: There are a good many different opinions among people, Professor, as to the comparative healthfulness of the two as a beverage, what would you say as to that?

Prof. Prescott: The question as between tea and coffee is about like this: At present the chemical conclusion is — and yet we do not say beyond peradventure — that it is open to question. The present conclusion, chemically, is that the alkaloid, the part which is supposed to act readily upon the nervous system as a stimulant to produce wakefulness, is the same in tea and coffee. Of course that is a conclusion that is questioned by many people from their experience, and by a good many physicians, perhaps a majority of them say that there must be a difference between the alkaloid of tea and the alkaloid of coffee. We do not say but it is possible that such a chemical difference does exist. In the meantime if you examine the reports of those who have made careful experiments with animals and men as to the effect upon the heart or circulation and all the functions, of the alkaloid of tea and the alkaloid of coffee, you do not get any agreement as to what that difference is. If there is a difference there is no literature to show it, there is nothing to show what the difference is, and so the question is open for further evidence. In the second place there are other things in tea besides alkaloids that influence health. The astringent matter is much heavier in tea than in coffee. Then there is much nutritive matter in coffee, fatty matter, and there is nitrogenous matter that may be of benefit in many cases and a detriment in others, for, undoubtedly, it is a disturbance to digestion in many persons.

Mr. Parkill: So in a cup of coffee you would get more alkaloid than in a cup of tea?

Prof. Prescott: The same. We have had that question investigated from all points of view. One of our workers went to fifteen or twenty boarding houses in Ann Arbor and tried to get statements from them as to how long a pound of tea would last in comparison with a pound of coffee.

Probably coffee is a little bit stronger in alkaloid as we generally drink it than tea. Of course there is a great diversity in the strength of these. What we call "black coffee" is very much richer in alkaloids. There is not over one quarter of the alkaloid left undissolved in making tea or coffee.

Mr. Brown: In the case of tea, the longer you steep it, the more tannin you get.

Prof. Prescott: Yes, but that comes very slowly.

Mr. Brown: What is the difference in the percentage there in those samples, do you know?

Prof. Prescott: The tannin in the tea amounts to about 14 per cent, and that in the coffee to about 3 per cent.

Mr. Parkill: The specimen of coffee you used was browned or unbrowned? Does the roasting of coffee have any effect upon the alkaloid?

Prof. Prescott: Not very much. It drives off more water. It concentrates about as much by the loss of water as it wastes by loss of alkaloid.

Mr. Vernor: I move that the further reading of papers be discontinued for the afternoon, and that we now adjourn until morning.

Mr. Parkill: Before we adjourn, I would like to ask for a change in the order of business. I notice the matter of Trade Interests is put down for late in the morning, and as that is likely to be an important matter, I think it would be well to have it put down as early in the morning as possible.

The change was made in the order of business, so that Trade Interests should be first taken up.

The Association then adjourned until the following morning at 9 o'clock.

AUGUST 3, 1892, 9 A. M.—The Association was called to order by the President.

President: The first business in order this morning is the

REPORT OF THE SECRETARY.

The secretary reported as follows:—

To the members of the Michigan State Pharmaceutical Association:

Your Secretary begs to submit his annual report for the year comprised within the dates of Oct. 21, 1891, and Aug. 3, 1892.

RECEIPTS.

Balance on hand Oct. 21, 1891	$556 57	
Dues during year to Aug. 2, 1892	448 00	
		$1,004 57

DISBURSEMENTS.

Date.	Voucher.		
Oct. 21, 1891,	14,	Cheboygan Tribune	$ 8 50
" "	15,	Cheboygan Democrat	7 00
" "	16,	C. A. Bugbee, secretary	225 00
" "	17,	D. O. Haynes & Co., printing	23 70
" "	18,	Anderson Mfg. Co., membership committee	16 66
" "	18,	C. A. Bugbee, expenses	45 23

Oct. 31, 1891	19,	H. J. Brown, local secretary	$50 00
" "	20,	D. O. Haynes & Co., letterbook	1 50
" "	21,	C. A. Bugbee, expenses	4 94
" "	22,	Peninsular Printing and Publishing Co., circulars	6 50
" "	23,	Peninsular Printing and Publishing Co., stationery	8 50
Nov. 12, "	24,	Herschel Whitaker, stenographer	50 00
Dec. 3, "	25,	Peninsular Printing and Publishing Co., slips for Executive Committee,	4 00
Dec. 3, "	26,	H. J. Brown, engrossing certificates	2 45
Jan. 20, 1892	27,	Peninsular Printing and Publishing Co., receipts and circulars	3 25
" "	28,	H. G. Colman, postage	70
Jan. 30, "	29,	C. W. Parsons, postage proc	35 00
Feb. 12, "	30,	Peninsular Printing and Publishing Co., circulars, slips, and labels	22 00
			$514 93
Balance, Aug. 2			$489 64

One thousand copies of the proceedings of the ninth annual meeting held at Ann Arbor, were printed and mailed, one to each member, and the balance to a carefully selected list of journals, secretaries of boards of pharmacy, and associations, and to leading representatives of pharmacy, as well as to all colleges of pharmacy. The expense of issuing this work was $333.25, but your Secretary is pleased to state that the receipts through advertising were sufficient to cover this expense, except one item of $10, which one advertiser failed to pay for his advertisement. The total expense, exclusive of mailing, was $10.

During the year your Secretary has written 502 letters, and has sent out circulars as follows: —

Three thousand general circulars bearing application blank for membership.

Three thousand slips addressed to druggists of Michigan.

Three thousand slips from the President calling attention of pharmacists to the general circular.

Two hundred and fifty card circulars for the Committee on Adulterations.

Three thousand circulars were furnished to the Secretary of the board of pharmacy, who transmitted them to the druggists of the State, asking for their votes as to member of board of pharmacy. The result of this voting was presented in the volume of proceedings, together with some other correspondence held by the Secretary with the Board of State Auditors, relative to payment for service of an attorney in prosecution of violators of the law.

Three times he has sent notifications of dues to members. In receipting for dues, he took occasion to inclose some kind of circular, generally the one pertaining to membership, or the announcement of the next meeting.

He transmitted, as instructed by the By-laws, program of this meeting to all members.

This involved a very large amount of clerical work, but it is hoped it has borne or will bear satisfactory fruit.

The members of the several committees were promptly notified of their appointment and occasionally reminded that reports were expected from them at this meeting.

Your Secretary regrets that in response to the 3,000 circulars sent endeavoring to increase our membership, he has received but eleven applications, which have been duly acted upon by the Executive Committee and the candidates received. The Committee on Membership, composed of wholesale druggists, offered a cash prize to the one who would turn in the largest number of new members, and it is hoped that in the report of this Committee there will be seen a very pleasing accession to the roll.

During the past year there have come to the attention of your Secretary, deaths of two members, E. W. Bartram, Paw Paw, and C. H. Kirkwood, Ishpeming.

Three members have resigned, viz., C. H. Franz, Saginaw, C. F. Kremer, Saginaw, and W. R. Mandigo, Sherwood.

Four members have been dropped for non-payment of dues.

Two members formerly dropped, have been re-instated through payment of past dues.

There is outstanding on the books an indebtedness from members of the following amounts in dues:—

211	at	$1.00	$211
91	"	2.00	182
48	"	3.00	144
1	"	4.00	4
			$541

still due the Association from its members.

The Secretary begs leave to offer a number of suggestions and recommendations, which bear so close a relation to his report that it is difficult to make a sharp separation. He recommends,—

1. That the Association adopt definite dates for its official year. He believes this year should extend from January 1st to December 31st inclusive. The reasons for this are strong. The By-laws definitely state that members should pay their dues in advance. Through custom they have as a rule paid at the time of meeting, and in consequence the impression has gained ground that by paying at one meeting membership was held in force until the next annual gathering. In carrying out his prescribed duties, the Secretary has met with not a little criticism, not all of it good natured, which may be traced directly to this miscomprehension. He suggests that members should be required to pay in advance of January 1st, and such payment hold membership in force during the entire succeeding year. So long as our annual meetings are held in the same month, confusion will not arise, but when held one year in August, another time in June, and another in October, there at once arises a very annoying condition of affairs, which leads to this recommendation to take definite action to establish a definite fiscal year.

2. Great trouble is experienced in the collection of dues. It is not right that the Association should expend so great an amount of postage in sending notifications to which no attention is paid. The Secretary would therefore suggest that in cases where members are two years in arrears, and do not remit in response to the first notification, they be drawn upon by the Secretary for the amount of their indebtedness; and, further, that if this plan fails, their names be dropped from the roll for non-payment of dues. As is reported above, there is a sum of over $500 due the Association, more than half of which could have been collected if such a rule as the proposed one were in force. There are instances where a member who is in arrears prefers to be dropped and then rejoin, which he could do at a lesser expense. In such cases no application should be considered until all arrearage is paid.

3. It is believed that a more satisfactory system might be achieved in the matter of issuing certificates of membership, and your Secretary would recommend some such plan as this: Issue a certificate of membership upon receipt of dues, such certificate to consist of a lithograph sheet, upon which is left a blank for the name of the member, and across the face of which is printed in large figures the year in which his membership is in force. The filling out of this certificate upon receipt of the member's dues would require no additional work on the part of the Secretary; it would serve as a receipt to the members, and protect the Association against a number of abuses which have come into life.

There are in the possession of druggists in this State many certificates of membership in this organization the holders of which are no longer members, having resigned or been dropped for non-payment of dues, and your Secretary feels that some such system as is proposed, for yearly registration, if it may be so called, will prove both beneficial and satisfactory and tend toward an increase of our membership. The proposed certificate could be prepared of a nature worthy of being framed, and when hung up in a drug store, would bear weight with the public, demonstrating to them that its holder is in good standing. One or two instances will show the necessity for a change of some character.

The Secretary received a letter stating that the writer had lost his certificate of membership through the burning of his store and he wanted it replaced. It was found upon search of the records that this individual was dropped several years ago for non-payment of dues, and the new certificate was refused. In another case a member of this Association (but who never paid for a certificate) in purchasing a store from a brother druggist, bought with the stock a certificate of membership, the name of which was erased and his own inserted.

It would seem important that this Association be represented at the meetings of sister associations, particularly in the adjoining States. The past year the delegates appointed were notified and requested to attend these meetings. But so far as known, this Association was represented only at the American Pharmaceutical Association, and only there by members who went for other reasons, and not primarily as delegates. It is therefore suggested that the Association or its Executive Committee look into this matter and see if provision cannot be made for paying all or part of the expenses of delegates to the meetings of the more important associations.

Your Secretary has received a very large number of letters, the greater portion of which have been on matters connected with his office, and a number were duly turned over to the committees for their consideration. There are others of a nature worthy of the attention of this body in general session, which at the proper time will be called to your notice.

The several Committees will have interesting reports to read.

In conclusion your Secretary would crave the indulgence and pardon of the members for any fault of omission or commission, which it is unnecessary to state were in no way due to intention. There have been several complications due to misunderstanding or miscomprehension in the matter of dues, whose explanation by the Secretary has (so far as is known) been in each case satisfactory in clearing away the misunderstanding. He would express to each and all, particularly to the officers and committees, his hearty appreciation of their good-will and the many courtesies and aid extended him.

CHARLES W. PARSONS, *Sec.*

Aug. 3, 1892.

Mr. Peck: I move that the report of the Secretary be referred to a committee.

Mr. Brown: I think it should go to the same committee to which the President's address was referred.

Mr. Bassett: I object to that.

The motion being put, prevailed, and the report was so referred.

President: How large a committee will you have, and who shall be appointed?

Mr. Brown: A committee of three, to be appointed by the Chair.

Mr. Peck: I would add to my motion that it be referred to the committee having charge of the President's address.

Mr. Wurzburg: The Committee on President's Address has already made out its report, and it seems to me another committee would better take this in charge.

Prof. Prescott: I move that a committee of three be appointed by the Chair.

The motion being put, prevailed.

President: I will appoint on that Committee Messrs. Parkill, Brown, and Rudolphy.

Prof. Prescott: In accordance with the President's request, the question box was placed upon the table yesterday. The opening of the question box is not, to my knowledge, the particu-

lar duty of any committee or body, and I beg leave to move that the First Vice-President be requested to take charge of the question box.

The motion being put, prevailed.

President: The next business in order is the report of the Committee on Legislation, of which Mr. Vernor is chairman.

Mr. Vernor: The Committee on Legislation has had no meeting, but as chairman I have prepared a short report, which I now submit.

REPORT OF COMMITTEE ON LEGISLATION.

To the Michigan Pharmaceutical Association:

GENTLEMEN: — Your Committee on Legislation have the honor to report, that as there has been no session of the Legislature since the appointment of the Committee, there has been no work for them to do. This fact was foreseen at our last meeting, as shown by the report of the former Committee, who in making their report asked that the recommendations that they made, be referred to this Committee with instructions to again present them at this meeting; they were as follows: —

"That in the event of there being introduced in the Legislature, as there are sure to be, bills intended to nullify the beneficial advantages of the Pharmacy Law, the proper forms of remonstrances may be placed in the hands of every member of this Association at the earliest possible moment, and (to prevent a recurrence of the disappointment of last winter) to be accompanied with the request that they be forwarded as soon as signed, to the Chairman of your Committee on Legislation, to be placed by him in the hands of a member of the Legislature who is friendly to the Pharmacy Law, for presentation at the proper moment, thereby preventing the withholding of said petitions from presentation through their falling into the hands of members who do not look upon the Pharmacy Law with favor;" also,—

"That a carefully prepared bill be introduced in the next Legislature, that shall provide for necessary amendments to the Pharmacy Law in the following particulars: First, to make proprietors equally responsible with the employee, for violation of the law by the employee. Where the latter is unregistered, the present law says that the proprietor 'shall not permit,' and as a result all the proprietor has to prove is that he told the clerk not to make sales during his absence; the reading should be 'in whose place of business shall occur.'

"Second, to provide that the Board of Pharmacy shall be plainly authorized to employ any legal assistance they may find necessary in pursuance of the carrying out of the provisions of the law, and also give the necessary power to an Attorney so employed, to permit of his making complaints against the violators of the law, without the necessity of first getting the permission of the prosecuting officer of the county in which the violation is found to exist."

The action taken by this Association at its last meeting, in relation to this feature of the work of the Board of Pharmacy, resulted, as you are already informed through the published proceedings, in the partial withdrawal of the Board of State Auditors, from the position taken by them in the matter, and shows somewhat the influence this Association has upon legislation, when the matter under consideration is of a pharmaceutical nature.

Your Committee recommend that the course proposed by the former Committee be carried out, and that the matter be referred to the next Committee on Legislation with power to act, and we further earnestly ask the members of this Association to respond heartily and promptly, when called upon by that Committee for personal letters or petitions to the State Legislature, or its members.

Respectfully submitted,

JAMES VERNOR, *Chairman.*

Mr. Vernor: I move that the report be received, and the recommendations be concurred in.

Mr. Bassett: I understand by that report of Mr. Vernor's that the Committee on Legislation contemplates the formulation of these bills and the presentation of them to the legislation?

Mr. Vernor: Yes.

Mr. Bassett: I wanted to be clear on that, so as to be sure the work would be done.

Mr. Vernor: The Committee recommends that they be given power in the matter of getting up the bill.

Mr. Bassett: I certainly hope that will prevail.

Carried.

President: The next business is the

REPORT OF THE COMMITTEE ON MEMBERSHIP.

The committee through its chairman, Mr. Fairchild, submitted its report as follows:—

Mr. President and Members of the State Pharmaceutical Association:

Your Committee on Membership regret that from lack of interest in the Association by the drug trade of the State, we are unable to make a satisfactory report. The druggists in the State have been shown the benefits of organization, by circular letters from the Secretary, inclosing applications for membership, and have also been solicited by the travelers of the wholesale drug trade. Very few have responded, and a large number of those who have been identified with us have neglected to pay their dues, and have been dropped from the roll of membership.

Your Committee cannot account for the lack of interest in an organization that was formed for the purposes of the improvement of its members and the good of the trade, and would suggest that each member, on returning to his place of business, should take with him a blank application for membership, and not rest until he has a signature to the same. Also that the Secretary be instructed to have printed some applications in smaller form than the ones now in use, so that traveling representatives of the wholesale houses can more easily carry them, and that a supply of the same be given to each jobbing house to be distributed.

H. B. FAIRCHILD, *Chairman.*

On motion of Mr. Vernor the report was accepted and placed on file.

President: The next business is the report of the

COMMITTEE ON TRADE INTERESTS.

Mr. Peck is the chairman.

Mr. Peck: In the absence of any prescribed rule or limitation as to the subjects upon which this report may be based, the Committee have covered the whole field belonging to it, and so their report will consider a subject which will perhaps be of interest to the Association. We have endeavored to avoid the old problems which have confronted us heretofore, except perhaps the subject of cutting prices, which we still hold to the front.

To the members of the Michigan State Pharmaceutical Association:

1. Your Committee on Trade Interests appreciate the responsibility of making a report of their work for the past year, and would be indeed pleased if they could offer suggestions, or outline a plan of action by which the present disability (under which the pharmacist is now struggling) could be mitigated or

removed. At the opening of the year the indications pointed to substantial relief from the inroads which have so disastrously affected the business of the retail druggist. But the failure of the Manufacturers' Committee to stand by each other, in consequence of an apprehension that such action would conflict with the Anti-trust law, and thereby render them individually liable, seemed to dispel for the time being the hope that had been entertained, that at last we should find protection against the blighting inroads of the cutter. But these events, however, do not utterly discourage us, because we are conscious that within ourselves as pharmacists, we have a reserve power, when all else fails, that can be brought into operation through the influence of our State and local Associations; and this influence if we are but true to our own interests and to our Association, will secure to us the right which we claim from manufacturers, viz., protection. The remedy to which your Committee refers is the discouragement of the sale of any proprietary medicine sold by the cut-rate stores, and in the place of such medicine urge the sale of goods manufactured and put up by ourselves. Let the war be against the cut-rate articles, and we shall soon secure all that we demand.

It is not presumed that individual effort will produce much impression, but we know the power of numbers, the value of organization, and the strength of a united movement by all the members of this and sister State Associations. As a last resort, your Committee believe that such an attack upon proprietary medicines would stimulate the efforts of the united manufacturers in the sale of their merchandise in its legitimate channel, and at least, will bring the weight of their influence against the department store and cutter. Because when their sales are diminished, the terrors of the trust law will not prevent them from adopting the A. P. A. plan, and testing its validity in the courts if assailed by the cutter. In this connection your Committee would urge upon every pharmacist in the State the duty of joining the M. S. P. A.; for through its efforts lies his only hope of a restoration of prices on lines of goods sold by the piratical cutter, and loyally standing with his brethren in a united body, laying aside all petty jealousies, and work for the common good. Because at this time we especially need all the available help to encourage and further the efforts that may only be secured by unity of action.

2. Your Committee would also urge upon the pharmacist the necessity of manufacturing as far as possible his elixirs and similar preparations. This portion of his business has become gradually absorbed by the large manufacturing houses. While it is conceded that some fluid extracts and other preparations may be more advantageously purchased than manufactured in a small way, yet the fact is patent that hundreds of preparations are now being habitually purchased that can with little effort be manufactured on the premises at a saving of at least 50 per cent from the manufacturer's prices. The habit which we are apt to fall into of buying what we can quite as well manufacture, is injurious to us in many ways, not only financially, but also tends to lower our professional standard by an implied acknowledgment to the physician and the public that either our knowledge or facilities fail to meet the demands upon us, and that in consequence we seek recourse to other sources. It is also necessary to call the frequent attention of physicians to our own preparations, to sample them judiciously, especially if we have something really superior of its kind. In other words, show them that they are interested in what interests us, and prove by the superiority of our products that we can better serve them than the far-away purveyor. Win their friendship if possible, but do not arouse their antagonism.

3. It is expected that the subject of liquor legislation will be again brought forward at the meeting of the next State Legislature, and the good offices of this Association will be sought for our mutual protection. It is therefore proper to urge every pharmacist to comply with all the provisions of the law and to refrain from any violation thereof. Your Committee observe with regret that some druggists in different cities advertise wines and liquors in their store windows, giving the name of the wine with price per pint attached. Others advertise wines and liquors in the newspapers, urging the sick and weary to possess themselves (for a consideration) of a bottle of such and such wine. All these efforts should be condemned. They are the belongings of the saloons, and no druggist or pharmacist should resort to such nefarious means to increase his income. If he

must sell all the liquors he can, let him in a manly way open a saloon, retire from the drug business, pay his license, and reconcile his conscience with the profits made under legal authority. The efforts in the past of the Committee on Liquor Traffic of this Association, have been made arduous through the perversion of the privileges and rights of the respectable pharmacist by the liquor vender under the cloak of our honorable calling. If the guilty alone could be made to suffer for their own acts, the ends of justice would be assured. But there is danger that the punishment will fall alike upon all, and that a tax will be imposed both upon the law abider and the law breaker. Therefore let the sentiment of this Association be unmistakably against any palliation or excuse for the violation of the liquor law.

4. Your Committee would also recommend that an effort be made to induce some wholesale drug house within the borders of the State, to act as the depot for the purchase, sale, and exchange of unsalable and odd stocks of proprietary medicines, and also to issue a catalogue enumerating such goods as they may accumulate from time to time, and invite therein the exchange for other goods, charging such difference as may be just and proper. The time has come when a stock of this kind, embracing about all that ever has found even a limited sale, will prove profitable to the wholesale druggist, at the same time serve as a medium for inducing orders for staples, owing to the fact that the much required, odd, or remote articles may be found with him, besides giving the retailers an opportunity of turning over at some price, goods that have not met an expected sale or demand, and would .otherwise represent only idle capital.

Mr. Dodd, of Buchanan, moved as an amendment that Messrs. Peck, Vernor, and Bassett, be a Committee to put this resolution in effect; that any expenses incurred be borne by the Association, and when these arrangements are complete that the membership of the Association be notified by the Secretary.

Passed.

5. The subject of prices that should be charged neighboring retail druggists for their small needs from time to time, may properly be introduced in this report. Such wants being simply accommodation demands, serving to supply competitors only until goods arrive, etc., should be discussed, as it is an *everyday* problem with *every* pharmacist, as to what may be considered a proper charge, and one concerning which there appears to be no special applied rule governing the price. Your Committee would recommend the following adjustment as tending to dispose of the question in a reasonable and satisfactory manner. Let the pharmacist simply divide the profits with his fellow pharmacist, for instance, if the article costs $8 per dozen, and retails for $1, the charge would be 84 cents, just one half of the 33 cents margin. The same rule should be adhered to regarding apparatus, elastic stockings, trusses, etc., sold to physicians, being just to the dealer who carries the stock with the attending risks, and to the physician who prescribes and fits the article or appliance required.

6. The relations existing between the employer and the employees as applied to our profession is worthy of consideration, as there is no fixed rule governing special questions that frequently arise. A general application respecting the time given for vacations, or consumed by illness, notice given by employees desiring to terminate an engagement, or the reverse, by the employer, who finds it to his interest to make a change, may, in the opinion of your Committee, be introduced, and discussed, in the hope that action may be secured that will prove mutually advantageous to all parties interested. After careful consideration founded on the experience of several employers, your Committee, in order to be concise, recommend to employers and registered pharmacists the following line of action. This recommendation however may not be adapted to all cases, but still may serve as a just and equitable method of disposing of questions which arise in every pharmacy. As all employers desire to be as liberal in all things pertaining to the good and welfare of those associated with them as circumstances and situations will permit, the following may furnish a plan which we think will be agreeable and mutually satisfactory, being the rules adopted by

some of the pharmacies in large cities. In case of prolonged illness of an employee, not less than one week's pay be allowed ; not less than one week's vacation be allowed each year with full pay; not less than one week's notice being required from either party in the event of dismissal or resignation, except for cause.

Your Committee are aware that the subject is a delicate one, and may or may not be worthy of discussion, but its importance none will deny, and the difficulties all have experienced in arriving at a just decision will serve as a reason for bringing it to the notice of the Association.

In conclusion, your Committee would say that much work has been accomplished in reconciling conflicting prices among druggists throughout the State, and while our power has in the nature of such efforts been limited, we have invariably resorted to the milder methods in inducing cutters to conform to the established prices. The volume of correspondence has been considerable, and we believe every complaint has received proper and prompt attention. But many discouragements arose, the principal being the refusal of parties at fault to answer letters, and also of the parties who complained, declining to permit their names to be made known in the premises. In a few cases of persistent cutting, appeals were made to the Detroit and Grand Rapids jobbing houses requesting them to decline furnishing supplies. And your Committee feel that proper acknowledgment should be made to the wholesale druggists in the cities above named, for their generous co-operation in acceding to such requests, thereby establishing themselves as enemies to the impending demoralization of the drug business of the State.

7. The practice of manufacturers of putting up their pharmaceutical specialties in containers of odd design and measurement, is opposed to the interest of the pharmacist, and subjects him to loss in dispensing. The following articles have been selected simply for purposes of illustration : —

P. D. & Co.'s Cascara Cordial contains 12 fl. ozs ; Caulocorea Cordial 13 fl. ozs ; Elixir Three Bromides 11 fl. ozs ; Wheeler's Elixir 14 fl. ozs ; Hayden's Uric Solvent 11 fl. ozs ; Kennedy's Pinus Canadensis 12 fl. ozs.

Your Committee believe that considerable loss is sustained by dispensing from such irregular containers, as it is necessary for the pharmacist to measure the contents of the package before he can become acquainted with the number of ounces therein, and also to memorize such measurement. The article known as Kennedy's Pinus Canadensis, Dark, is sold by the avd. pound, but contains but 12 fluid ounces. Your Committee believe that the odd, irregular shaped bottles, like the peddlers panelled ware, are only intended to deceive, and that honest regular containers should only be employed, holding 4, 8, 16, and 32 fluid ounces, thereby enabling the dispenser at a glance to determine just how much per ounce the preparation costs him. The odd shaped packages may serve the manufacturer as a trade mark, but it would seem that a copyright label offers all the protection necessary. We would therefore recommend regular glassware for all pharmaceutical preparations, as being a great aid to the dispenser, besides enabling the buyer to know at a glance the quantity he pays for.

So many new preparations are now being brought to the notice of physicians, that uniformity of measurement is greatly to be desired, and cannot result in loss to either interested party. JOHN E. PECK, *Chairman.*

Mr. Wurzburg: I move that the report be accepted and discussed by section.

Carried.

President: The next business in order is a discussion of the report by sections. The Secretary will read the first section.

First section read by the Secretary.

Prof. Prescott: I move that the recommendation be concurred in and adopted as the sense of the Association. I make the motion for the purpose of bringing up a discussion and also because I am prepared at present to vote for it.

A Member: I would like to ask the gentleman what he is going to do with the druggists who are close to the cities where they have large department stores?

Mr. Parker: From personal experience I think the weak side on which we can attack manufacturers is in reference to circulating their printed advertising matter. They seem to be very solicitous upon that point. I remember having quite a correspondence with C. I. Hood & Co., upon that very point, and the tenor of the correspondence showed me very conclusively that they desired to retain the friendship of the retail druggists. While a great deal of patent medicine will be sold by the department stores and the cutters, yet it will not all be sold in that way, and it is in our hands largely. You go into a great many of the retail drug stores of the country and you will see a stand or a dry goods box neatly covered, and you will find on it every circular and catalogue they can get hold of, conveniently displayed for people to take. While the druggist is doing that, he is doing the very thing the manufacturer wants him to do, while the manufacturer turns around and allows him just a bare margin on the goods, enough to pay him cost of handling. It is my practice in my store to distribute no advertising matter whatever. I make a few exceptions in the way of almanacs. I keep one kind down under the counter and when they ask for almanacs I give these out. Other than that no advertising matter of any kind is distributed from our store. No patent medicine signs are ever exhibited, and I find it has worked to my benefit. People notice it and they speak about it, they give you credit for running a legitimate business, and physicians especially give you credit for discouraging the sale of proprietary articles.

Another mistake is to allow patent medicine advertisements to be inserted in newspapers over our names. Several times in the past year physicians have called my attention to the fact that they will not allow their prescriptions to go to certain druggists who permit their names to be so used. I think if the druggists of Michigan would adopt the plan of refusing to circulate patent medicine advertisements it would perhaps be as effective as anything we could do. There are plenty of reliable houses putting up reliable preparations, and it is safe to use them, and a large part of the people will buy articles so prepared instead of patent medicines, like sarsaparilla, for instance.

Mr. Peck: This question is very far reaching, further than we have any idea of. I was in New York last April and I took some pains to investigate the subject of patent medicines. I found that a majority of reputable jobbers were supplying cutters; that they had no hesitation in selling a gross of Ayer's Sarsaparilla or Kennedy's Discovery at a certain price and crediting up cash with the balance. All such means are resorted to to supply the cutter, and in some cases it seemed to me that the proprietor must be cognizant of the fact. I believe the only resource we have is to attack the medicine itself; diminish the

income of the manufacturer and bring him to a proper state of mind and to our terms. If he considers the druggist as the legitimate outlet for his medicines he must recognize him and repudiate and refuse to sell to cutters or to parties who sell to cutters.

Prof. Prescott: This particular recommendation we now have before us, as I understand the phraseology which was quite current a few years ago, is that we engage in substitution of other things for proprietary articles which cut prices. It is to be remembered that a great outcry was made against the enormous sin of substitution of other articles for patent medicines. Pharmacists might as well understand their rights in the matter of truth and justice with respect to patent medicines or a great majority of them. The recognition of the right of a patent medicine as an original article different from any other article, is a recognition to which the manufacturer really has no right in a majority of cases. It is by sufferance that it is allowed to go so. I think that the manufacturers of patent medicines might well understand that if they expect that a certain article which they have named and advertised, which has in itself nothing original, no rights of discovery, no special merit, the composition of which most pharmacists know right well, the composition of which physicians can learn very easily, that no special rights to that particular article under copyright should be held, at all events subject to a proper mercantile and commercial management of the article; that they violate ordinary trade regulations when they yield to the cutting of prices on such articles, they have forfeited any "privileges," not rights, which they have held by sufferance.

Of course a real discovery is entitled to credit; it can be patented under the patent laws of the United States and other countries and can be maintained. Most of these articles have no right to be, and could not be, patented if it were undertaken. They are simply copyrighted articles, and it seems to me that theoretically, as we approach the millennial stage, medicines of secret composition ought to be done away with altogether, they have no rights which true pharmacy is bound to respect. Certainly when they violate trade rights they cannot expect us to respect those privileges.

President: This recommendation has in it somewhat of the tone of a coercion of the manufacturers, and I would like to ask the chairman of the Committee on Trade Interests if he thinks that necessary in many cases? if it is not a fact that the majority of manufacturers of proprietary articles are in sympathy with the retail trade, that they desire and would be willing to do whatever they can to protect them, without any threat? I think it is wise always to avoid anything in the nature of a threat, and rather leave the threat as a last resort.

Mr. Parker: The proprietors are the ones who are trying to coerce the retailers. I have probably every week in my store a representative from a specialty house. I have had long con-

versations with them and they will wind up with the statement "you have got to buy it. I was simply calling on the doctors and thought I would drop in to tell you where to get it." It is a question of coercion on their part, and their packages are getting smaller and their prices are going the other way.

President: You are not referring to patent medicines?

Mr. Parker: To proprietary medicines. They are intended for dispensing — broadly they are proprietary articles. That plan they are adopting now, and some of them never come to see the retailer at all.

Mr. Peck: Many manufacturers are very fair, and I am satisfied are doing their best to keep their preparations out of the cut-rate stores. Others are indifferent; although they nominally take the stand on the side of the druggist, yet we find their goods everywhere and we also find the cutter has no difficulty in buying them.

I do not think, however, if we are to inaugurate a war, that we can help declaring against all goods found in cut-rate stores as a whole, as the report indicates. I think the result would be that the manufacturers would see that the cut-rate man did n't get them. Marks of identification can be used to find who the jobber is who is furnishing them to the cut-rate store. I do n't think you will find R. V. Pierce's goods in the cut-rate stores, and others perhaps; still the most salable and best advertised goods are now in the cut-rate stores. I think if the association of manufacturers, and others had adopted the A. P. A. plan this problem would have been solved and these medicines would have been kept out of the cut-rate stores.

Mr. Vernor: As I understand it the proposition now is to change the plan of battle from fighting the cutter to fighting the cut-rate article. Is that it?

Mr. Peck. That is it.

Mr. Vernor: I can see where that will lead to. It will increase the cut-rate stores. Instead of having one in Detroit you will have a dozen, because the moment you let up on the cutter they will all become cutters, and if they can get it in nine stores out of ten where is the fight coming in?

Mr. Bassett: I think I may say with a reasonable degree of assurance, feeling that I believe what I say, that I am in sympathy with this resolution as it stands at the present time, and in arriving at that conclusion I would like briefly to state my reasons for reaching that position. While I may say some things that may appear to be possibly personal and possibly harsh, we have come to a point, in my mind, where I believe we have the right as men who have our money at stake and our reputations at stake, to stand up and say what we think, and if the other fellow do n't like it, why let him talk back.

I want to say right here that I am very sorry indeed that there is no one present here except myself who attended the last meeting of the A. P. A., but in the last year I have attended three national meetings and the main topic of discussion,

the one absorbing, important question, at all those meetings was this question. I think Mr. Vernor and Mr. Parkill will bear me out in the statement that at the meeting in New Orleans a year ago last May the proprietors and manufacturers of proprietary articles sent us a telegram asking us to formulate a plan, which they would adopt. I think we had reason at that time to think they were sincere, I did at least, and I will state here that I was a member of the committee that formulated that A. P. A. plan, and I at that time was thoroughly impressed with the fact that the manufacturers of proprietary articles were in earnest. I stand here to-day, however, and say without one qualm of conscience, and I believe I am stating the truth, that besides R. V. Pierce I do n't believe there is a prominent manufacturer in the country who is sincere in an intention to protect the retail trade in obtaining the prices which they place upon their packages. That is a strong statement, but I am not the only one who believes it, and I am going to prove what I say, or am going to give you some facts that to my mind prove what I say. I have got the facts from being the secretary of the Commercial Section of the A. P. A. The president of that section and myself have the facts in black and white and I know what I am talking about.

Mr. Kline of Philadelphia, the man who is chairman I think, or secretary, of the committee for the enforcement of the various plans which have been offered through the country, at Louisville, with all the labored eloquence at his command impressed upon that meeting that they were doing everything in the world they could to protect the retail trade. The committee of five appointed by the A. P. A., of which I was one, allowed them to shape the A. P. A. plan to suit themselves, and they gave us every assurance they could in words that they would try to enforce that plan. They went right straight out from that association — and now I am going to be personal here, because we put it to Mr. Kline in the Profile House, Mr. Kline himself, his own firm, sent men out through the country and sold his own goods from house to house and sold them at any price he could get for them. We have letters that show that they left their goods in city after city and they would go back after a time and say, If you do n't want to pay a quarter for them pay fifteen cents, and if you do n't want to pay fifteen pay ten. What do we now find? This committee which was appointed at New Orleans, which was called a tri-partite committee, the A. P. A. appointing their part of the committee, and the wholesalers appointing a part, and the manufacturers appointing a part, had two sessions in the city of New York. Men were there from Dubuque, Iowa, and from other points, representing our interests, and after they got them bound down to a plan and down to a point where they could enforce the plan, when they found they could n't do anything else, they began to get legal opinions to see why they should not enforce it. They received three legal opinions. One of them was to the effect that this

plan could be enforced without any danger of opposing the Anti-Trust Law which they held up as a bugbear, another one decided there was danger, and the third one was non-committal. It suggested that there might be danger, but if they undertook to enforce it he did n't believe there would be any question. Now there is the foundation of the refusal of those proprietors to enforce that plan. I now ask you if I have not proved my assertion that I do not believe these men are honest in their desire to protect us in the sale of these goods? They are simply juggling with the thing back and forth, and saying to themselves, where can we make the most sales? We go down in the scale unless we can increase their sales, and the moment we demonstrate to them that we can make their sales or break their sales, that moment we become of interest to them.

I believe we have the right, a bread and butter right, to stand up and say that when any men come to us with a nostrum which we do not believe there is any particular value in — and I do n't believe they believe so, half of the time — and charge us an arbitrary price, we have the right to insist that they shall see that that price is sustained. It is all arbitrary from beginning to end — and we should say we don't want to sell them, and I believe we can have an influence in fighting these goods.

Mr. Brown: There is one question I would like to ask the chairman of the committee. If this plan were to be adopted or this motion carried, whether, in cities like the one which I come from, where we have no cutting of prices, we should be expected to conform to this plan?

Mr. Peck: The cutting of prices is confined in a great degree to large cities on account of the department stores, that is all. My personal opinion is that in twenty or twenty-five years from now the retail drug store will have to go, in the cities; that almost all the necessities will be sold by the department stores, but while we live we of course desire and expect to combat this question. I do n't see that it cuts any figure or can in towns where there is no cutting. Does that answer the question?

Mr. Brown: Yes; at the same time I don't think you can make this plan successful, because the small towns in the aggregate sell as many patent medicines as the large cities, and I fancy in most of the smaller towns there is no cutting, for those stores are all going to continue to sell those medicines, and the manufacturer will not feel it very extensively if a few stores in the large cities continue to sell them and the cutter continues right along. I don't think it will affect the manufacturer very much.

Mr. Peck: I believe the resolution states that it applies only to department stores or to cities where cutting is now being carried on. Will you please read that portion of the report, Mr. Secretary? (Secretary reads.)

Mr. Peck: I think that answers the question. I would expect however that this resolution or the action contemplated

by it would not end with this State. I think by proper effort a plan could be formulated to carry sister organizations with us in other States and to make it general. I don't imagine that action alone by Michigan is going to have much effect on the manufacturers, but if we can bring in the surrounding States we can make an impression that will be felt.

Mr. Parsons: It seems to me from a somewhat extended study of this subject in the last four or five years, that any resolution you adopt must be sweeping in its effect. If you restrict it to cutting centers it will not affect anything. If this Association adopts this recommendation the result of it must be that every member of this Association who votes for this resolution must go home and stop selling. If Mr. Brown, in Ann Arbor, keeps on selling it will only affect a few dealers in the large cities. I don't see how it can be made effective unless it is universal.

Mr. Parkill: That brings up the point I have in my own mind. I suppose in the Association there are six or eight hundred active members, and in the State something like three thousand pharmacists. In the adoption of such a plan, if it were confined to the members of this Association, it would place us at a disadvantage who are in the Association. I wanted to inquire of the committee if they had thought of this. In the formulating of any plan, in order to receive benefit it must be general. For instance there are many towns where there are only two drug stores, one man belongs to the Association and the other does not, and the man who does cannot afford to take such a step. If he did he would simply lose half his trade and he would go to the poor-house.

Mr. Lyman: If you threw out all the patent medicines you would throw out the goods that sell, and those that don't sell you would have on your hands, they are no good to us. I think it would be very difficult to get united action in this matter. If you could, it might do.

Mr. Vernor: The point made by Mr. Parkill is a good one. I could not vote for the adoption of that resolution. I would not care to go home and throw out all my patent medicines, although I sell but few of them. My patent medicine trade don't amount to anything, it is killed through the cut-rate stores, still I would not want to oblige myself not to sell patent medicines. I think the practical result of the adoption of the recommendation of the committee would be to turn seventy-five stores in Detroit into cut-rate stores inside of thirty days.

Mr. Lyman: I don't see any phraseology in that clause that requires us to throw out patent medicines. It is simply a recommendation that pharmacists discourage the sale of cut-rate goods. That seems to be an easy matter, to discourage the sale of them. We should talk to the agents as they come in and say, If you are going to continue to sell goods at cut rates we are going to discourage the sale of them. The only way to reach this is to have this Association pass a resolution, or to amend

the By-laws. That, of course, would be unjust, because the only thing I can see that it would accomplish would be that we would request the pharmacists who live in the villages to fight the city fellows' battles. We fellows in the villages do n't have much trouble. We have a little association of our own, that is in Newaygo, and we both like the almighty dollar too well, and consequently there is no cutting there. I would be in favor of this recommendation, that the pharmacists discourage in every way they can the sale of these goods, without compelling any member of this Association or any registered pharmacist to throw out patent medicines.

Mr. Parsons: The wording of the clause is, " Refuse to deal in any such medicines."

Mr. Bassett: I understood that recommendation to be to discourage the sale.

This thing resolves itself into three points with me; that we should discourage the sale of all goods sold at cut rates, and that we should substitute, if you see fit, goods of our own manufacture. I tell you, that that is what is sounding the death knell of these patent medicines, and, far from concurring with Mr. Peck, I believe that patent medicines have got to go, and the retail druggists are the ones who are going to drive them out. We can do much in our own State. We are simply a body that corresponds to some forty-four other bodies of the same nature in the United States, and they are all talking on the same line and it will result in the death of these goods eventually. First, we must discourage the sale. I do not think we ought to pass a resolution here saying arbitrarily, we will not deal in these medicines, because that would be unjust to these people where there is no cutting, it would be unjust to us in the cities where they are cutting, because if we can sell a bottle at the price, we ought to do it; but let us refuse to educate the people to a use of these things. The moment thirty-five thousand druggists of the United States refuse to be used as a means to educate the people, that moment the first stone is taken out of the foundation and the building will begin to fall. Let us educate them to use something we make ourselves, and then each man is building up his own reputation.

The third point is that the stronghold of the sale of these patent medicines is not in the country. I am not prepared to offer any statistics as to that point, but I am prepared to say that I believe the larger proportion of these things is sold in the cities and in the cutting centers. Detroit represents, with its surroundings, about one fifth of the State of Michigan as to population. The people come there from twenty, thirty, and fifty miles away, and they buy these goods if they are cut, and we certainly represent more than one fifth of the sale of these goods if they are sold at cut prices. The same thing holds good in New York and in all the large States and cities. They sell car loads of this stuff in the cutting centers. It takes a great many of these small orders to aggregate any such amount as

that, and if we can kill these things in the cities we will do a good work.

Mr. Dodds, of Buchanan: Mr. Parkill summed the whole thing up when he said there might be some who were members of this Association in a town and there might be other druggists in the town who were not members of this Association and we would be at their mercy. That is my case. There are two druggists in my town. I am the only one who is a member of this Association. I live on the line of the Michigan Central and our headquarters for purchases is in Chicago. There are probably five hundred Chicago papers distributed in our town every morning and evening, and there is a man in Chicago who runs a store called the Economical Drug Store. He has six registered pharmacists in his dispensing department, and they sell Allcock's porous plasters and advertise them for eight cents a plaster, most pills for a shilling a box, some of them for ten cents, and so on through the list. They publish daily in the papers a list of prices and they go through the list, section by section, giving prices, and they say, "We are opposed to trusts, to high tariffs. Here is what you pay when people want to do business on the square." It only costs twenty-five cents to get an express package from Chicago, and there are quite a number of people who avail themselves of this opportunity.

I was thinking that in Chicago, with a population three times that of the State of Vermont, a druggist could afford to cut prices and still make more money than one in Grand Rapids who sustained them. These manufacturers want to sell their goods, and if a man in Chicago can sell a thousand packages while in my town we can sell only fifteen or twenty, are the manufacturers not going to give that man the advantage? And if we oppose them in this way will not these manufacturers get together and say to the dealers in Grand Rapids, Chicago, Louisville and elsewhere, We will go to work and put in an institution in these towns of our own and we will put in registered pharmacists and we will sell all patent medicines and nothing else? Do you know that the "dear people" think that the druggists are making immense fortunes out of their business? that they make their stores the headquarters of high prices in all instances where they can, east and west, north and south, and in addition charge them with keeping a saloon? Of course those who are doing a legitimate business have to suffer as well as the others.

In our town we don't have any cut-rate prices. Mr. Brown says he has n't any in Ann Arbor. We get at this in some other way. This gentleman here has sized it up for himself. He makes his own preparations, he passes out no advertising matter, and he wants the other part of the resolution that the manufacturer shall not sell to physicians. All the doctors in our town dispense their own medicines, their own prescriptions — most of them are Homeopaths, and they buy, of course, direct. They do not sell patent medicines and we have no trouble with them

on that score, and they do n't patronize us. They buy their medicines of the supply houses. Detroit is full of them and Chicago has got a lot more.

It seems to me the discouragement of the sale would be about right. I would vote for that, but as to the refusal to deal in them I would say no. If we fight too hard against these manufacturers I imagine they will start a patent medicine store in every large city in the United States. This is a free country you know.

Mr. Peck: We always hand out the patent medicine to the purchaser when he calls for it, but suppose we have a medicine put up, that is similar in style, of our own manufacture, that we know to be meritorious. When the original article is called for we can take out both packages, and submit them to the customer, and let him take whichever one he chooses, and I think the winning package would be the domestic one every time.

Mr. Brown: I want to refer to one thing Mr. Bassett has said, in regard to substituting or recommending some similar preparation of our own or something that we have had made for us. If they call for Hood's Sarsaparilla we can try to sell them Brown's or Vernor's. Now I believe there is a better way than that. We all know the average customer will ask us what we think of this patent medicine or that; whether it is good for this, that, or the other. If you are conscientious and still want to sell it you will perhaps say you do n't know anything about the composition of it, but it is a good seller and you sell lots of it, and you let them buy on that. You sell them the patent and if you do n't you sell them your own. I believe there is a better way than that; to say you do n't know anything about the patent medicine, and say to them, If you are sick and need medicine the best thing for you to do is to go to a physician and let him prescribe for you.

Mr. Vernor: What would become of those triturates?

Mr. Brown: I want to tell Mr. Dodds that he can do business with those Homeopaths. You can do it, and it do n't cost a great deal of money to carry their preparations, and it is as legitimate as any other business. They have a nice line of remedies and you can buy them at wholesale and you can get your prices for them and it is a nice trade. I believe we ought to make an effort to cultivate the physician by doing that very thing. Of course some physicians are hard to get at but you will never make a friend of a physician if you do n't attempt it. You will never succeed with him if you sell to his patient a patent medicine, either of Hood's make or your own. If you tell a patient the best thing for him to do is to go to a reputable physician and let him prescribe for him, if the physician is mean enough to put up his own medicine you can't help it.

Mr. Vernor: I move that we adopt the recommendation as amended.

Prof. Prescott: We would like to hear from our President.

Mr. Colman: There has been one point referred to here and it was alluded to in the President's address yesterday, and that is that if we are to accomplish anything in this matter we must have associated with us not only the members of this Association but all druggists of the State, whether they are members of this Association or not. While we do not succeed in getting druggists throughout the State to join this Association, it seems to me if we could get them committed to some action on this one point we might perhaps accomplish a great deal.

I think the amendment to the resolution which does not commit us to a refusal to sell these goods was a wise amendment. I do not think we are ready yet to take such a radical step. I do not think it would be helpful, and I do not think we would all be true to such a resolution if it were adopted, even though we might subscribe to it in principle.

The resolution as it now stands is to discourage the sale of these articles and to substitute, if possible, other articles, made either by ourselves or made for us. I am not sure about its being wise to put in that last clause. If we simply say we will discourage the sale of those articles, then we can substitute other articles made by ourselves or for us. We can recommend, in other words, articles which are not found in cut-rate stores, or recommend them to the physician. I do not think myself that the sale of patent medicines interferes with the business of the physician very largely. My own experience has been that when a man is real anxious about himself or about some member of his family he will go to the physician to get his medicine. If patent medicines could be done away with entirely I don't believe it would increase the practice of physicians very materially. I believe it would revive the compounding of the old fashioned domestic recipes. My experience is that we do not put up nearly as many old family recipes as we did before. They have been supplanted by the patent medicines.

I think the suggestion Mr. Parker made awhile ago has something in it. I am in sympathy with the patent medicine business to a certain extent, as you know, but I have not thought it wise myself for druggists to allow their names to be attached to the bottom of a patent medicine advertisement or to be very officious in any way in pushing a patent medicine. The physician sees it and he gets down on the druggist and I think it reacts on the druggist, and while it is proper to sell some of these things I do not think it is wise to antagonize the physician unnecessarily.

I think it would be well to interest all the retail druggists of this State in this one point. Don't let us attempt to do too much, don't let us try too hard to get them to join this Association, but let us call their attention to the fact that in many parts of the State the retail trade is suffering from cutting and let us try to get a large part of the retail trade to stand by each

other in this matter and to at least discourage the sale of these articles. Let us refuse perhaps to distribute advertising matter, refuse to speak a good word for the medicines, and let us push our own preparations, and in every way give these medicines a cold shoulder. I think there are a great many druggists who would subscribe to that course and that the result in the end would be considerable, and then perhaps later on we can accomplish something more positive in the matter.

Mr. Parker: I do n't think we could commit ourselves to the matter of substitution. I would offer an amendment, that that section be adopted in so far as it relates to the matter of sale only.

Mr. Vernor: I will accept the amendment.

Mr. Bassett: I would not subscribe to that at all. I do not see why the druggist has not the right to sell his own goods. I do n't see why we have n't the right to stand up in the face of these men and say we have the right to sell our own goods. It does not necessarily follow that we need to put them up in the form of the other articles. I do n't see why we should not stand up and say that we will assert our rights to sell our own goods.

Prof. Prescott: On this question of substitution I said a few words before. Now upon the right of substitution of medicines for medicines, upon the right of substitution I am willing to take the stand upon the affirmative, but upon the expediency of substitution I have no opinion. That is a question touching trade interests and it is for trade interests that we are to decide this question. The question whether it would be wise to meet cutting by concerted substitution is a question which I am not very well prepared to pass upon and judge. I consider it to be a purely mercantile question.

Mr. Dodds: I am heartily in sympathy with the amendment from the fact that every druggist making a sale will be selling his own preparations. As to this question of substitution, I will say that it is a matter in which the people like fair treatment. If the patent medicine man has to spend money selling it he ought to be treated fairly, and I do n't know that we have the right to steal his property any more than any other man's. If we can put up a medicine and sell it to people and let them know it is our own I think it is perfectly proper.

Mr. Bassett: I think the gentleman from Buchanan who last spoke, has spoken of the thing which we want to give most attention to. We want to drive this discouragement of patent medicines home by asserting the fact that we are going to sell our own goods. Take the article of Zoaphora. The maker sells it to us at eight dollars a dozen and says to the public on the label you shall pay a dollar for it. So long as that man carries out his contract in good faith, and we have the right to insist that he shall, we are in sympathy with him. We do n't try to rob him, but the moment he says you must pay me eight dollars for it, and I will sell it to somebody else at sixty cents a bottle, he is robbing us where it is his duty to protect us. I assert that we should drive this home. We should say to him

under those circumstances, We will discourage the sale of your goods if you do that and we will see to it that we sell our own.

Mr. Peck: There seems to be a misunderstanding about this resolution. I will read it again. It has no reference to any foreign medicine, it simply recommends the sale of goods put up by the pharmacist or under his direction for him.

Mr. Wurzburg: I think, as has been said, that without the latter part the former part of the resolution would amount to nothing.

President: The question is on adopting the recommendation to discourage the sale of medicines sold in cut-rate stores.

The motion being put, prevailed.

Prof. Prescott: I move that the language of the recommendation as first read to us be restored and that we adopt that recommendation.

Mr. Bassett: I think possibly that in the minds of some of the gentlemen present there is a slight objection to the wording of that clause. With all due respect to Doctor Prescott I think he will agree with me, it seems to me there ought to be a little change in the language. I would like to amend it by saying that we pass the resolution that druggists, so far as possible, sell goods of their own manufacture in the place of goods sold by cut-rate stores.

Prof. Prescott: I will accept that amendment if Mr. Bassett will put it in writing.

Mr. Bassett: I offer the following amendment. "And in place of such patent medicine urge the sale of goods manufactured and put up by themselves."

The amendment being put to vote, prevailed.

President: The Secretary will read the next recommendation.

The next recommendation was then read by the Secretary, relating to the manufacture of elixirs and other preparations by the druggist.

On motion of Mr. Vernor the recommendation was concurred in.

The Secretary then read the third recommendation.

On motion of Mr. Dodds this recommendation was concurred in.

The Secretary then read the fourth recommendation of the committee to the effect that wholesale houses establish a depot for the sale and exchange of unsalable goods.

Mr. Vernor: I think this is a very valuable part of the committee's report. There are few of us who have not more or less dead stock on our hands that we wish to get rid of, and I think it is a matter to be talked over carefully, and I hope that some plan may be adopted other than the mere adoption of the resolution. There ought to be some way devised for carrying out this suggestion. I hope to hear from some of the other members before we come to a vote.

Mr. Bassett: I agree with Mr. Vernor that this is a very important recommendation, but I have very grave doubts about

our ever being able to get any regular jobbing house to take this matter up, because I think there are insurmountable difficulties in the way of their doing anything of the sort. There is a man in Chicago by the name of Fisher who makes that his business entirely, the buying and selling and trading of goods not salable in one part of the country that are in some other. I think if it were generally known over the State that there was a house of that kind in Chicago it would answer the purpose. I think this man could do better by us than any jobber could.

Mr. Wurzburg: I know Mr. Fisher and I have done considerable business with him. I don't know how it is in Detroit, but I know when he comes to Grand Rapids he only calls on three firms.

Mr. Bassett: I suppose it would be impossible for him to call on every firm, and if he did the dealing with the most of them would be so small it would not pay him. If a dealer would drop him a postal card and say, I have such or such an article, what will you give for it? I presume he would receive a reply.

Mr. Dodds: I would move an amendment to that resolution as follows: That Mr. Vernor, Mr. Peck, and Mr. Bassett be appointed a committee of three to carry into effect the recommendation contained in the resolution, and if any expense attaches to their work it shall be paid out of the funds of the Association, and that they report their finding.

Mr. Peck: I think one difficulty in dealing with Fisher would be that his business is almost exclusively with the jobber. He picks up his odds and ends by the gross or more, but if some wholesale druggist would attempt to keep this medicine in stock the pharmacist could send in a small order of a twelfth of a dozen or so and obtain his regular source of supply. That would be the advantage of having some wholesale druggist take it up instead of Mr. Fisher, who is a specialist in that line.

Mr. Dodds' amendment being put to a vote was carried.

The fifth recommendation was then read by the Secretary.

On motion of Mr. Wurzburg the recommendation was adopted.

The sixth recommendation was then read by the Secretary, relating to the relations between the employer and the employee.

Mr. Peck: Perhaps a word of explanation might be proper in this connection. The committee found that in some pharmacies the clerks were not allowed any vacation; they were asked to work throughout the entire year. I presume each pharmacist will do in the matter as he thinks best, and the majority do give their clerks a vacation. In our store, for instance, where a young man comes with us he claims he has had two or three weeks' vacation before, but that would mean an equal vacation for every man on the force, and so we are obliged to fix upon some regular time.

A Member: I would like to amend that by saying "not less than a week." If he wants to give him more he can.

The amendment was accepted by the committee, and upon motion the recommendation as amended was adopted.

The seventh recommendation as to uniformity in the size of glassware was then read.

Mr. Bassett: I would amend the recommendation by saying that the Secretary of this Association be directed to send to the National Druggists Association and to the Manufacturers of proprietary medicines a request embodying the suggestions contained in the resolution.

Carried.

Mr. Parkill: There are some recommendations in Mr. Parsons' report which if the Association sees fit to act upon will make it necessary to amend the By-laws. Notice has to be given at one meeting in order to pass an amendment, and I give notice now that I shall introduce an amendment to Art. IV and Art. V. I give notice of this now so that the Association can amend these articles in accordance with the recommendations, if it sees fit, at the next session.

The Secretary then gave notice of the proposition of the following names for membership, Messrs. E. T. Van Ostrand, Allegan; W. H. Dendel, Hopkins Station; and Samuel R. Smith, Grand Rapids, and on motion they were duly elected.

On motion the Association then adjourned.

THIRD SESSION.

AFTERNOON SESSION, AUG. 3, 1892.—The Association was called to order by the President.

The report of Prof. A. B. Stevens, delegate to the American Pharmaceutical Association, was then submitted and read by the Secretary.

REPORT OF DELEGATE TO A. P. A.

As your delegate to the A. P. A. I desire to report one of the most successful meetings the Association has ever known. The attendance was larger than at any previous meeting. There were about 400 applicants for membership, which I believe is the largest number ever received at one meeting.

A large number of interesting papers were presented, but as most of them will soon appear in the various periodicals it will be unnecessary to give them further notice here.

I will call your attention to the reception given us at various points that you may see how much you have missed by not going with us. Also as a bait to induce you to meet with us in Chicago next year.

By far the greater number of the Association met in Boston, Monday morning, and were given our choice of either an excursion to Plymouth that we might see and walk upon the ground our forefathers trod, a dinner, or an excursion to Salem to see where the witches were so cruelly persecuted. Tuesday we were given an excursion to Bass Point and passed through the camp channel that the Constitution passed through when she escaped from the British after they thought they had her cornered. We were given a dinner on the island, and on our return to the city were given a carriage ride and a reception in the evening. Wednesday we started for the mountains but were

waylaid on Lake Winnepesaukee by the New Hampshire druggists and given a dinner. We arrived at the Profile in the evening and went directly to our rooms where we found our baggage waiting for us. Thursday, Friday, Saturday, and Monday were given up to the Association, except an occasional mountain climb, and two entertainments by Prof. Churchill on Saturday and Monday evenings. Tuesday we went up Mt. Washington where we were given another dinner by the Massachusetts druggists. Wednesday we went up Mt. Willard and on our return to the Crawfford House were given a dinner by the Diamond Dye company in the name of the Vermont druggists. We arrived in Portland, Me., in the evening, where we were given a reception by the Maine druggists. Thursday they gave us a carriage ride in the morning and an excursion to Long Island in Portland Harbor where we were given a Clam Bake. At night we bade our friends adieu and started for home, many saying that they dreaded to go back to rolling pills and selling postage stamps after such a royal time.

However upon this as upon many other occasions happiness went hand in hand with grief, and the shadow from the wing of the Angel of Death fell upon our Association in the removal of our loved friend and fellow-laborer, Prof. Bedford of New York City. He went with us in apparent good health but was taken sick Saturday and died the following Wednesday, thus again teaching us the lesson to be prepared for death at any moment.

Respectfully submitted,

A. B. STEVENS.

On motion, the report was received and placed on file.

President: We have other delegates to State associations who should report.

Secretary: The other delegates were duly notified of their appointment a couple of weeks prior to the times of meeting. In each case they stated they were unable to go, and hence a certain recommendation that I submitted to you this morning.

The Secretary then submitted and read a letter from Mr. H. D. Hatch, President of the Illinois State Pharmaceutical Association, notifying this Association of the appointment of delegates by the Illinois association to represent them at this session. Upon inquiry it was developed that they were not present.

President: We will now listen to the report of the Committee on Adulterations.

Secretary: Mr. Snow, the chairman of that Committee, has left the State, and Mr. F. B. Raynale was made chairman, but although he promised to be here, he is not present.

Mr. Wurzburg: I see that the first order of business for the afternoon is the report of the Committee on President's Address. The chairman of the committee is not present, but I have the report if you are ready to hear it.

President: We have left then no unfinished business, except the report of the Committee on Pharmacy and Queries.

Secretary: Will it be in order to take up some miscellaneous business?

Prof. Prescott: I would ask the Association to receive instead of the report of the Committee on Pharmacy and Queries, a report of the Contributions of the School of Pharmacy, a good part of which has already been presented. The committee has no further report to make.

President: We will now take up the miscellaneous business mentioned by the Secretary.

Secretary: As most of you are aware, at the recent meeting of the American Pharmaceutical Association it was decided that they would meet next year in Chicago. There will also be held in Chicago the seventh annual meeting of the International Pharmaceutical Congress, for which the A. P. A. is making great preparations, and a number of the State pharmaceutical associations have decided to meet there, even from such far-away points as Alabama, Arkansas, and Minnesota. It is suggested that as many pharmaceutical associations as possible hold their meetings in Chicago. In this connection is received the following letter from Mr. Oldberg: —

CHICAGO, U. S. A., June 11, 1892.

President H. G. Colman, Mich. State Pharmaceutical Association, Kalamazoo, Mich.

DEAR SIR: I have the honor to call your attention to the general invitation extended by the World's Congress Auxiliary of the World's Columbian Exposition to the State Pharmaceutical Associations of the United States to be represented in the World's Congress of Pharmacists, to be held in this city during the season of the World's Columbian Exposition in 1893, and also to the invitation extended by the American Pharmaceutical Association to all Pharmaceutical Societies to send delegates to the Seventh International Pharmaceutical Congress, to be held at the same time and place. The said invitations are herewith enclosed.

It is also suggested that the State Pharmaceutical Associations hold their special meetings in the buildings of their respective States on the World's Fair grounds, in 1893, and as Chairman of the Pharmaceutical Committee of the World's Congress Auxiliary, and Chairman, also, of the Committee of the American Pharmaceutical Association on the Seventh International Pharmaceutical Congress, I would respectfully request that you place this matter before your Association at its coming annual meeting, for such consideration as the Association may be pleased to give.

I beg to suggest that five delegates be appointed to the Seventh International Pharmaceutical Congress, and that the Association also appoint any desired number of delegates to the Columbian World's Congress of Pharmacists.

I shall be greatly obliged if you will kindly acknowledge the receipt of this invitation, and also inform me what action the Association takes in the matter.

Trusting that your Association will have a successful meeting, I have the honor to be, Yours very respectfully,

OSCAR OLDBERG.
Chairman Phar. Com. of the W. C. A.

Secretary: The Secretary has also received a number of letters during the past year with the query, "What good is your Association doing me?" I will not read the names of the individuals, because I do not think they would care to have them stated in open meeting. One man whom I approached for back dues referred me to an article which he wrote for publication some time ago. I will read his letter: —

You perhaps saw an article in the "*Pharmaceutical Era*" of Feb. 15th written by myself in which I said that my retaining membership in the Association remained to be seen.

I at that time did think of dropping out of the Association for the reason I could see no good coming out of it. I have changed my mind since however and will remain at least another year that my dollar may help to do good if I am unable to do good otherwise.

I never feel able to attend the meetings of the Association; it usually costs more than I feel able to expend.

Another gentleman says, "I pay two dollars each year for protection and can't see that I am protected by it." I have here two other letters. In answer to these I have written as courteously as I knew how. I have said to a number of these gentlemen that the Association is an aggregation of individuals; that each individual has the same privilege as others and is just as much entitled to his views and an expression of them as any one else; that if he stays at home and never takes any interest in the Association he cannot justly charge the Association with any failure to transact business which he does not help carry on. One referring to the Board of Pharmacy appointments has more or less justice in it perhaps. I answered him that the Michigan Pharmaceutical Association was the body which, primarily, secured the passage of the law by which he was protected, and it thought it had some right to say who should be appointed on the Board. I also have a letter from Mr. Frank Inglis regarding his inability to attend the present meeting and assuring us his hearty support; also letters from Mr. Pauly of St. Ignace and from Mr. Bugbee of Cheboygan to the same effect.

President: Unless there is something that requires special attention in these communications, they will lie over until to-morrow morning. The next business in order is the

REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS.

The report of the committee was submitted by Mr. Wurzburg as follows: —

To The M. S. P. A.:

GENTLEMEN: Your Committee to whom was referred the President's address would respectfully report —

That they have carefully examined the report and find four points upon which we think we should report.

1. In regard to the supplying of Physicians with goods by others than Druggists. In regard to this we feel that the President's remarks are correct. While we may deplore the fact, we do not see how it can be helped, for the President justly says the physician has a right to buy his supplies where he sees fit.

2. *The Cutting of Prices.* Your Committee believes that much has been accomplished and that more will be done at this meeting looking to the curbing of this evil, and would recommend that careful attention be given to this question with a view of bringing about practical results.

3. *Organization of Druggists.* Your Committee believes that this is the one necessary thing to do, and all other things will follow; if we could ask unitedly for what we want of any manufacturer or jobber we would be sure to get it. We therefore recommend that this Association take steps looking towards the organization of all the druggists in the State into some kind of a trade organization.

4. *The Holding of our Next Annual Meeting in Chicago.* Your Committee is not clear as to the advisability of this, but would recommend that the matter be discussed by the Association and settled as good judgment may dictate. All of which is respectfully submitted.

A. BASSETT,
F. J. WURZBURG,
A. H. WEBBER.

On motion of Mr. Parkill, the report was accepted.

On motion of Mr. Bassett, it was decided that the report should be taken up and considered by sections.

The first section of the report, relating to the supplying of goods to physicians and others by druggists, was then read by the Secretary.

There being no discussion upon this section, it was passed.

The Secretary then read the second section as to the cutting of prices. This recommendation had already been considered by the Association and was passed.

The third section as to the organization of druggists was read by the Secretary.

Mr. Bassett: In explanation of this third recommendation, I will say that the constant cry from the manufacturers and jobbers is organize, organize; come up as an organization unitedly and ask for what you want, and I believe with the balance of the committee that the interests of the druggists of the State in this question is so great that if it were properly put before them we might have a trade organization that would be of some weight. We therefore recommend that some steps be taken to organize all the trade into a general organization.

President: I might say here that it seems it would be well if we would refer this same matter back to this committee and ask them to draft a definite plan of organization. I simply make that as a suggestion. Has any one any motion to make?

Mr. Bassett: I hardly think that is the thing this time. This committee is widely scattered and has no means of coming together. I move that this question be referred to the Executive Committee of this Association and that they formulate some method and present it through the channels of the Association.

Carried.

The fourth section was then read by the Secretary.

President: The discussion of this question comes up regularly in our session to-morrow morning, and perhaps it is not best to discuss it now. If there is no objection, it will lie over. The next business in order is the

REPORT OF THE COMMITTEE UPON THE SECRETARY'S ADDRESS.

Mr. Parkill, as chairman of the committee, submitted the following report: —

Mr. Parkill: The only portion of the Secretary's address, I suppose, that it is contemplated we shall report upon, is covered by the recommendations the Secretary presents.

The first recommendation is that the Association adopt some different time for the ending of its official year, in order that the annual dues of the Association may always be due at a certain time. The Committee to whom the address was referred heartily concur with the recommendation, with the exception that it may be well to have the year end sometime about the 1st of May. Notices would necessarily be sent out about a month before the expiration of the year. Notices in December strike the average druggist when he is busy. If notices were

sent out about the 1st of April, they would receive better attention, and so the Committee heartily endorses the recommendation of the Secretary with the exception that the year shall begin the first day of May. In the spirit of that recommendation, we offer the following amendment to the By-laws: —

Section four of the By-laws to be amended to read as follows.

This is the wording of the section after amendment through discussion.

Every member shall pay to the Secretary, on or before the first day of January of each year, the sum of one dollar — any person in arrears shall not be entitled to vote. It shall be the duty of the Secretary to draw on all members when two years in arrears, previously sending notice of his intention to draw at a certain date. Any person neglecting to pay dues for three successive years shall forfeit membership.

Provided that any dues paid by new members before an annual meeting shall apply on the present year, but dues paid after an annual meeting shall be credited for the next year.

This also embodies the second recommendation of the Secretary, that some better method be devised for the collection of dues. The amendment provides for the dropping of members two years in arrears for dues. We also wish to insert that the Secretary shall give previous notice as to his intention to drop members.

Mr. Dodds: I move that we adopt the amendments to the By-laws as read.

President: I would like to hear from the Secretary.

Secretary: The idea of having the year commence the 1st of January was that our register, which has been prepared for a dozen years in advance, denotes each year. It makes no particular difference so long as the Secretary knows when the year commences and ends. It has been the custom, if a man joins to-day, for instance, to credit him for all of 1893. I don't think it is justice to make him pay for the brief portion of the year he joined. I think the Association can well afford to carry these new members for the extra few months represented between an annual meeting and the first of the following May. It does not amount to anything at all. I would not be in favor of sending these new members a notification the next May. I would not send the members elected at this meeting a notice until May, 1894.

A member: I would like to see the year begin January 1st instead of May. I think it would be easier for the Secretary to collect the dues. Just think of it, after the 1st of January those who handle holiday goods are flush, but how is it on the 1st of May? You have your $25 license to pay.

Another member: Not until the 1st of July.

A member: Well, there is something that is greater than that. He has spent a few weeks previous to that hustling around to find some one to sign his bond, and when the Secretary writes a receipt for dues, he can say that it pays for 1894, or

1893 as it happens, but if you pay the 1st of May, the man is paying for 1893 and '94. Men who belong to other societies pay their dues on January 1st, and when they are in the habit of doing it they can pay their dues to this organization at the same time.

President: I would prefer the 1st of January myself. I think it would be well to specify it so that when a man pays during the latter half of 1892 he may know that his dollar only carries him through to the 1st of January, 1894, if we make it January.

Mr. Dodds: It seems to me we are mystifying this more than is necessary. If the year ends the 1st of May and it is customary to admit members, a by-law ought to be brought in to say how much they should pay a month. That would pay his dues to the 1st of May and back of that time, and if you are going to let him off for a part of the amount, that can be effected by a by-law. But I should think no dues should be taken until the next May. I really doubt the propriety of admitting members in every month of the year. We can't register for a town election only once a year and that is a pretty good thing, and I think it would be a good thing to put names of members on the books of the Association only once a year. I hope Mr. Parkill may bring in a by-law governing this.

A member: I move as an amendment that we change it from the 1st of May to the 1st of January each year.

Mr. Brown: I think it has been customary for secretaries without any definite instruction and without any definite by-law to guide them, to regard the 1st of July as the beginning and end of our fiscal year as near as may be. They have been guided somewhat by the time of the annual meeting and by the time of their sending out notices. We send out the notices for dues at the same time we send out notices of meetings. Suppose we change this to the first of January, do those of us who have just paid our dollar here in July only get credit up to the 1st of January?

Secretary: I consider they have paid for all the year 1892.

Mr. Wurzburg: Has the committee made any report in regard to the recommendation made by the Secretary about issuing certificates?

Mr. Parkill: We have not reached that yet, that comes later.

Mr. Wurzburg: That is the point I am getting at. He recommends that a certificate be issued for a year. If you recommend favorably upon that, I think the best time for the payment of dues would be the 1st of January and let it go from year to year.

Mr. Parkill: The committee did not make any definite recommendation upon that matter. The whole trouble arises in the admission of new members, and the point we try to cover in this amendment to the By-laws is in the collection of dues after people have become members. We want if possible to get

dues from the members that are in. The only complication that arises at all is in connection with new members, and it seems to me we ought to fix upon some definite time in which a man can pay and have his dues apply on the current year. It seems to me when a man joins he has the benefits of the annual meeting, and I don't care whether it is in January or September, there is no earthly reason why his dues should take him over two years. I wish to insert that proviso, that dues paid before an annual meeting shall apply for the coming year, or membership fees rather, and dues shall be credited on the next year's dues.

President: Can you incorporate that in your recommendation?

Mr. Parkill: Yes.

President: Do so, if you please, and that proviso will apply to new members only.

Mr. Bassett: It seems to me the best way is to pay in January. He has all the benefits of one year and he gets the reports of the annual meeting, and I don't think you would get hardly any one to join in November or December.

President: Read the whole amendment as it now stands.

Amendment read, as above amended.

Mr. Bassett: I want to offer two amendments; that the dues be made payable on the 1st of January instead of the 1st of May and let the dues of new members apply for a year.

The amendment carried.

President: Any new member paying his dues before or at the annual meeting, pays simply for that year. Any one paying after that, pays not only for that year, but for the following year.

Mr. Parkill: We recommend that the Association be represented at the meetings of sister associations in accordance with the suggestion of the Secretary. We heartily wish that some scheme could be devised by which we could prevail upon our members to go to these meetings, but I do not see how the Association can agree to pay the expenses of members we send to these places. I do not see how we can do it as a matter of finances. I should not feel like recommending, myself, that the Association should pay the expenses of a delegate, for I think we can make better use of the money.

Mr. Bassett: I do not believe in sending delegates to sister associations, and I don't think we ought to attempt anything of the kind. I do see great need of our being represented in the American Pharmaceutical Association. The question has been thoroughly discussed in the American Association, and I think if the members of this Association appreciated the good that might be done by having a regular accredited delegate at those meetings, with authority to speak for the Association, they would not hesitate to take this matter up. I am on record in this Association as being opposed to asking a delegate to pay his own expenses and I believe this Association can afford to

pay the expenses of a delegate to the American Association every year. I therefore move that the Association send a delegate to the American Association every year and pay his actual expenses.

Mr. Parkill: It has been my pleasure to attend two or three meetings of the American Association and so far as I have been able to observe, I do not find that other delegates have had any more weight or influence than a man who goes there as a humble member of the American Pharmaceutical Association. There are always some people who will go from Michigan and we shall always have somebody there and I am satisfied that this Association should not attempt to pay their expenses, as we are not in a situation to do it.

Mr. Parsons: If you send any delegates at all, send them in good shape. Do n't go through the farce of appointing delegates unless they will go.

Mr. Bassett: Prof. Stevens and I discussed this question this year at the White Mountains. If we are not able to pay the delegate, do n't let us send him; if we are going to send a delegate there, let him go there representing this Association. I have spoken in that association for Michigan, and so has Mr. Parkill, and we have never felt that we had the force of this Association back of us as thoroughly accredited delegates, who would be listened to as representatives of this Association.

Mr. Brown: Prof. Stevens was an accredited delegate.

Mr. Parkill: The By-laws are as follows: "Five delegates and five alternates shall be annually elected to attend the meeting of the American Pharmaceutical Association.

Mr. Vernor: There is one way in which this matter might be arranged satisfactorily without any expenses whatever, that is, by making it the duty or privilege of the President of the Michigan Association to name delegates to the State association meetings and to the National Association, leaving it entirely discretionary with the President. Then any one who wants to go and can afford to go, or intends to go, can notify the President and he will be appointed and the thing is done and it will cost nothing.

Mr. Parkill: The Constitution says that five delegates and five alternates are to be elected each year. I am not entirely clear on that point. Does not the constitution of the American Association provide for the number? My impression is it provides for the number an association may send.

The question was looked up and it was found that the American Association fixed the number.

Mr. Bassett: I will withdraw my motion, as it seems to be unconstitutional.

Mr. Parkill: I think myself it would be an excellent scheme to have these delegates appointed by the President, instead of elected by the Association. We can change the By-laws very easily by giving notice of such an amendment. I give notice of the following amendment to be acted upon at another meeting.

The President shall appoint five delegates and five alternates annually to attend the meeting of the American Pharmaceutical Association.

The committee discussed the recommendation somewhat with reference to issuing a certificate. We were in accord with the recommendation of the Secretary. Then again comes the matter of expense. The having of a certificate is optional with a man. He has it or does n't have it, as he pleases, and we preferred that this question should come up for discussion before the Association. We might adopt a resolution by which a man could have a certificate for each year at a cost of ten or fifteen cents.

Mr. Parsons: My idea was that the certificate need not be an expensive one. A few cents would cover it. I do not see how it would be any increased expense at all to the Association. You could get ten thousand blank certificates at first and you could print in 1892 or 1893. They would not be on parchment.

President: It would virtually be a receipt for dues.

Secretary: Yes, and it would be a good piece of printing, and the recipient could have it hung in his store if he saw fit. The printing would be very little, it would n't cost more than one or two cents. Under those circumstances we could not charge new members a dollar for a certificate.

Mr. Vernor: The postage on those certificates would cost probably from four to six cents, and you would have to put them in a mailing tube.

Mr. Bassett: I move that the Secretary be instructed to prepare a certificate which will serve as a receipt for yearly dues, the certificate to be gotten up under the direction of the Executive Committee.

The motion being put, prevailed.

The Treasurer then submitted his annual report as follows:—

TREASURER'S REPORT.

GRAND RAPIDS, MICH., Aug. 3rd, 1892.

Michigan State Pharmaceutical Association.

1891		Dr.
Oct. 21,	To balance on hand	$556 57
1892		
Aug. 3,	To cash from Chas. W. Parsons	448 00
	Total	$1,004 57

	DISBURSEMENTS.	Cr.
1891		
Oct. 22, By paid warrant, No.	14	$ 8 50
" " " " "	15	7 00
" " " " "	16	225 00
" " " " "	18	45 23
Oct. 23, " " " "	17	23 70
Oct. 29, " " " "	18	16 66
Nov. 6, " " " "	19	50 00
" " " " "	20	1 50

Nov. 6,	By paid warrant, No. 21	$ 4 94	
" "	" " 22	6 50	
" "	" " 23	8 50	
Nov. 19,	" " " 24	50 00	
Dec. 8,	" " " 25	4 00	
" "	" " 26	2 45	
1892			
Jan. 27,	" " " 27	3 25	
" "	" " 28	70	
Feb. 3,	" " " 29	35 00	
Feb. 17,	" " " 30	22 00	
			$514 93
Balance on hand			489 64
Total			$1,004 57

Respectfully submitted,
WM. DUPONT, *Treasurer.*

On motion the report was referred to the Executive Committee after being accepted.

The Association then adjourned to the next morning, August 4th.

FOURTH SESSION.

MORNING SESSION OF AUGUST 4TH.—The Association was called to order by the President.

President: Mr. Parkill was going to bring in an amendment this morning, and perhaps it had better be presented now.

Mr. Parkill: I present the following amendment to Art. 8 of the By-laws, so that it shall read as follows:

"The President shall appoint five delegates and five alternates to attend the meeting of the American Pharmaceutical Association."

The amendment was adopted.

Secretary: I have one more application for membership, that of Mr. David C. Scribner, of Grand Rapids.

On motion Mr. Scribner was declared duly elected.

President: Mr. Bassett, who was last year a delegate to the Wholesale Druggists Association, is prepared to make his report, I understand, and we will now listen to it.

Mr. Bassett: It is somewhat of a difficult matter to separate the work accomplished at the National Wholesale Association from the work done by the A. P. A., as the two are very closely interwoven, and I think it is no more than right that I should explain the steps leading up to the action taken by the proprietors, manufacturers, and wholesale dealers, and by the National Wholesale Druggists Association. I presume that it is now a matter of current history, but still it will possibly bear repetition.

At the meeting of the A. P. A. at New Orleans a year ago last May, a telegram was received from the Association of Manufacturers and Wholesale Dealers in Proprietary Articles, asking the A. P. A. to formulate plans for the protection and sale of their goods, and promising to adopt and enforce anything that was feasible. In accordance with this request, the

American Association appointed a committee of ten to formulate a plan. The committee had several sessions, and after a very thorough discussion of the whole subject, presented their plan, which was pruned somewhat by the Association, and finally adopted in the form in which it appears in the proceedings of the American Association. This plan was sent to the Proprietors Association, at a meeting called in Louisville, Oct. 19–22. At that meeting it was requested that the American Association send a delegation to present this plan to a joint meeting, and the officers of the A. P. A. appointed a committee of five to represent the Association at that meeting, of which I was one.

We went to Louisville and met the Wholesale Druggists Association and the Proprietors Association, those bodies having alternate meetings, one meeting in the forenoon and one in the afternoon. We there met Mr. Kline and others, and a very thorough discussion of that plan took place and the whole thing may be found in the report of the seventeenth annual meeting of the Wholesale Druggists Association. Representatives of the houses of Ayer, Jayne, Hazeltine, and Piso were there, and the whole thing was finally pruned down and changed somewhat.

I will not attempt to give the changes, but will simply say that they objected to some features of that plan. There were a large number of retail druggists there besides the committee, so the meeting was made up of jobbers, manufacturers of proprietary goods, and retailers, the retailers numbering almost as many as the others combined.

The plan was taken up on two or three different occasions in both Associations, in fact it seemed to be the whole life of the meeting, and after a thorough discussion, they were allowed to adjust this plan to meet their own views. Such men as Pierce, Hazeltine, and Bigelow took part in the discussion. We simply said, Go ahead and put this in force, and in view of the large number of retailers who were there, we called a meeting of the retail trade of the country. Mr. Torbert, of Dubuque, was president and I was appointed secretary. We appointed three members of what was to be called a tri-partite committee, the jobbers appointed three, and the manufacturers of proprietary goods appointed three, making a committee of nine. Our members were Mr. Torbert, Mr. C. T. P. Fennel, and Mr. Canning, and the committee met twice in New York.

When they met in New York the jobbers and proprietors immediately began to crawfish. They commenced to see that we had finally got a plan and they found they could not ask us for anything more. They tried to get at some other way of doing it, and without my going into detail as to the correspondence between Mr. Torbert, myself, and other members of the committee, which show how impossible it is to pin down these men to enforce the very thing they had asked for, when they found they had no other thing for backdown they asked for legal opinion, and the result of that I have already given you.

I will say that Dr. Pierce took the ground that the proprietors should enforce that plan.

After getting their opinion they came to us at the White Mountains the other day and asked us to get twenty thousand retailers in the United States to say they would put it in force and they would adopt it. You can readily conceive the spirit in which the American Association received that proposition. We simply left it. The outcome of that was that we spent a whole afternoon in the Profile House and we finally unanimously passed the following resolution, and it went through with a hurrah. There were not a dozen votes against it in the whole convention, and there was not a man who dared stand up there and oppose the resolution.

Resolved: That the plan of the A. P. A. certified by the joint committee of the National Wholesale Druggists Association be reaffirmed, and that this Association request the Proprietors and Manufacturers Association to execute this plan and put it into operation at the earliest possible date.

We also passed a further resolution, that the State Associations which have not yet convened shall be notified that the A. P. A. has re-affirmed this plan for the protection of trade interests and requests resolutions endorsing it, and we request these associations to put the A. P. A. plan into operation at as early a date as possible.

In other words, we stood up there and said, Gentlemen, there is the plan you asked us to formulate. You have been allowed to prune it to suit your convenience and now we insist that it be put into force. The Commercial Section appointed their officers delegates to a meeting in Montreal to be held at a certain date.

In view of these proceedings, I ask you as a State Association to pass a resolution affirming the position of the A. P. A. and that you ask for the same thing that the A. P. A. insisted upon, that these two Associations shall put this plan in force as soon as practicable.

I offer a resolution that the Michigan State Pharmaceutical Association hereby endorses the position taken by the A. P. A. in the matter of the A. P. A. plan.

Carried.

President: The next thing in order is the election of officers. I will appoint Mr. Hicks and Mr. Lyman to act as tellers.

On motion of Mr. Vernor, the Association proceeded to an informal ballot for President.

During the taking of the ballot Mr. Wurzburg offered a resolution that the Secretary be allowed $225 for his salary for the past year.

Carried.

On motion of Mr. Vernor, a warrant was ordered drawn for $50 as compensation to the local secretary.

Mr. Vernor: I move that a vote of thanks be tendered to Messrs. Hazeltine and Perkins Drug Co. of Grand Rapids for the entertainment tendered this Association. Also to the retail

druggists of Grand Rapids for the entertainment given the Association yesterday.

The motion was adopted unanimously.

Mr. Parsons moved that a vote of thanks be given to the daily press and their representatives for the excellent reports made of the proceedings of the Association, and also to Mr. Muir, the local secretary, for his services as local secretary.

The tellers announced the result of the first informal ballot for president as follows: Whole number of votes cast, 19; Stanley E. Parkill, 11; John E. Peck, 3; scattering, 5.

Mr. Vernor moved that the informal ballot be declared formal and that Mr. Parkill be declared the president for the ensuing year.

Carried.

President: As this is the last meeting of this session, I will ask Mr. Parkill to take the chair and conduct the proceedings.

Mr. Parkill: I thank the Association very heartily for the honor and for their expression of confidence.

Mr. Dodds moved that the rules of the Association be suspended, and that the Secretary be instructed to cast the ballot of the Association for John E. Peck as first vice-president.

Mr. Peck declined.

Mr. Vernor moved that the Association proceed to a formal ballot for vice-presidents, that each member cast a ballot containing three names, and the three receiving the highest number of votes be declared first, second, and third vice-presidents.

Pending the vote, Mr. Dodds moved that a vote of thanks be tendered Dr. Prescott for the interest taken in the Association, and the same was adopted.

President: During the taking of the ballot, we will listen to the reading of questions in the question box.

This is the first question: Why does a salt water fish taste fresh?

There was no discussion upon this question.

The next question was: What can be done to stimulate a proper and permanent demand for table waters as druggists' goods?

Prof. Prescott: It has often occurred to me within a few years past that there is a demand for good, cheap table waters, not claiming any special medicinal quality, but waters which can be resorted to by the traveling public at hotels and other places, and not only by these, but by the very great body of people who haven't confidence in city waters. A good aërated, distilled water is an excellent water, any extremely pure natural water aërated enough to be pleasant and well put up is an excellent article, and it has come to be the fact in our large cities that good water is one of the scarcest articles we have. Men tell me they drink milk when they stop at hotels, not because they like it, but it is the only liquid they can get to take the place of water.

Mr. Vernor: I have given this subject of aërated waters considerable thought, and I cannot see my way clear from a business point of view to put it on the market. There is undoubtedly a call for two waters,—people who are used to using soft water, and people who are used to drinking hard water, and if that demand could be supplied there would undoubtedly be a call for it. My experience has been that it costs too much to bottle the water and get it to the consumer. People will not go to a table at a hotel and pay 25 cents for a bottle of water, when they can get a glass of milk free. They do not realize that half of the milk is water. There is very little milk I imagine put onto the table pure. The trouble with bottling waters is in the return of the empties. If any one can see his way clear to bottling a water at not too high a cost there would probably be money in it. A gentleman, from Ravenna I think, told me he had in his store a running spring of water that was clear and soft and so pure that nitrate of silver did not affect it. If that man could see his way clear to aërate and bottle that water, he undoubtedly could do a large business.

Any water to become popular would have to be advertised, but if this gentleman who has this spring in his store would aërate and bottle the water and let it gradually come into use, he would in a few years get quite a business. People who come to Detroit and use our hard water have their digestive organs disturbed very frequently. But after all, the bottle question is the great question in bottling waters: In the first place, you have to put in an enormous number of bottles, and you have to make some provision for the return of those bottles, and then you don't get any return of the bottles until the end of the season, when they come back and flood you. Mr. Bassett has been in the bottling business and he can tell you more than I can about it.

Mr. Bassett: I have nothing to say, only that I dropped what money I put into it. If you put this water on the market, even a pure water, I do not believe at the present time with any ordinary facilities for the purpose of carrying bottles and carrying them in small quantities, a person could put a plain water on the market and compete with the waters already on the market and thoroughly established. You take Appollinaris and you undertake to bottle plain water and purchase your bottles and materials at the price one would have to pay, and you would find your margin of profit was very small.

The tellers then announced the following as the result of the ballot for Vice-President:—

The total number of votes cast was 60, of which Mr. Dodds, of Buchanan, Mr. Perry, of Detroit, and Mr. Hicks, of Morley, receiving the highest were declared elected the three Vice-Presidents, Mr. Peck and Mr. Dodds being tied and Mr. Peck withdrawing.

On motion of Mr. Dodds, the rules were suspended and Mr. William Dupont of Detroit was elected Treasurer.

The rules were suspended and C. W. Parsons of Detroit was elected Secretary.

On motion the Association proceeded to a ballot for members of the Executive Committee.

During the pendency of the ballot, the

EXECUTIVE COMMITTEE

made the following report, which was accepted and placed on file: —

Your Committee held a meeting in Grand Rapids June 10th for the purpose of making arrangements for this meeting; there were also present President Colman, Secretary Parsons, and Local Secretary Muir. Your Committee have carefully examined the books of the Secretary and Treasurer and found their reports as read by them correct.

F. J. WURZBURG,
Chairman Ex. Com.

Prof. Prescott: One of the papers which was announced in the report of the work of the School of Pharmacy ought to be read in summary to this meeting before it is referred for publication. It is a paper upon the Morphine strength of Laudanum generally dispensed in the State of Michigan, as found by assay.

The paper was then read in summary. (See appendix.)

Mr. Bassett: Don't you think it is possible that a man going out promiscuously in the way this person did in the cities of the State, getting these samples, might not get the best? I know a great many stores keep two strengths of tincture of opium. A man going out in that way would be liable to get a class of tinctures of that nature. It strikes me that is hardly a fair table to publish as to the strength of opium dispensed in the drug stores of the State.

Mr. Colman: It seems to me it is entirely fair. I would like to know what business a druggist has to keep two strengths of tincture of opium.

Mr. Bassett: Possibly if you were in a larger city you might see the necessity of having it.

Prof. Prescott: Of course these samples were not obtained on prescriptions, could not be very well, and I will see that it is very clearly stated that they were obtained on purchase and not on prescription.

Mr. Vernor: They were all labeled laudanum?

Prof. Prescott: Yes — I don't know about the label. They were called for as laudanum, I think. It was the understanding in obtaining these samples that they would obtain laudanum for domestic purposes.

The tellers reported as follows upon the ballot for Executive Committee, that the Association had elected Mr. Colman, Mr. Jesson, Mr. Bassett, Mr. Wurzburg, and Mr. Peck, and they were declared duly elected.

TIME AND PLACE OF NEXT MEETING.

Mr. Vernor: I move that the Association meet in Chicago at its next session, at a date to be decided upon by the Executive Committee, after finding out what time the American Asso-

ciation proposes to meet there, and that our meeting be held in the Michigan Building on the Exposition grounds.

Mr. Parsons: I think it is a rule adopted by some other associations, to hold a meeting in the State and to then adjourn to Chicago. I imagine if we are an incorporated body there is a question about our meeting outside the State. The Executive Committee might meet in Detroit, but in our books it must be shown that we met in Michigan and then adjourned. The other associations have generally left the time and place of meeting to the Executive Committee, it being understood, however, that the meeting is to be in Chicago.

Prof. Prescott: I am very doubtful about the expediency of holding a meeting in Chicago. I am afraid that very many of them would do well if they even registered their names. A visit to the World's Fair is going to be a very desirable thing. It is a thing that will occur but once in a lifetime. It is going to be rather expensive and rather a tiresome place to hold a meeting in Chicago and a pretty hard place to do the business of the meeting. What will we save by doing so? We will save the traveling expense to some place in Michigan perhaps, that is all we can save by doing it, and we lose the opportunity of a good meeting. Perhaps there will be persons faithful enough to make a quorum and do business, but I am rather inclined to vote no on this question.

Mr. Colman: Although I suggested in my address it would be a good idea, still I had my doubts about it, and I now believe that the objections to it are greater than the advantages that could be gained. The only advantage that I could see would be the opportunity to visit other State associations, or to have some union meeting perhaps to accomplish something of a wider scope than we can do in our present way of meeting. I remember when we met in Detroit a few years ago at the time of the Exposition that while there were a good many delegates in the city, comparatively few attended the meetings. I think we have our better meetings when we are in more retired places. Probably the excellence of our meeting is the first thing to be considered, and I doubt whether that would be conserved by going to Chicago.

Mr. Bassett: All that could be gained by meeting in Chicago it seems to me could be gained through the A. P. A. They have decided to meet in Chicago, and while they are very fearful as to the result of the meeting, yet they have decided to go there. It seems to me instead of the various associations meeting there if they would send their delegates to the A. P. A. they will at that time throw their doors open to the neighboring State associations. I think we had better hold our meeting in our own State.

Mr. Lever: I heartily approve of the remarks of Mr. Bassett that we should meet in our own State.

Mr. Jesson: I move to amend, and that we meet at the Star Island House the last Tuesday in June of next year at St. Clair Flats.

President: The original motion was not supported.

Mr. Jesson: Then I make that as a motion.

Mr. Bassett: I support that motion with the amendment that the place of meeting be left to the Executive Committee and that they select the Star Island House or the Oakland or some place on the St. Clair or Detroit rivers.

Prof. Prescott: I would suggest that Mr. Jesson say at such time as the Executive Committee may agree upon.

Mr. Jesson: Very well.

Mr. Vernor: As to the summer resorts of the St. Clair river the last week in June is the best time for the meeting if you meet there. They are all ready to entertain guests at that time. At Star Island a rate can be got for about a dollar and a half a day. There is accommodation there for about one hundred and twenty-five people providing two are put in a room.

Prof. Prescott: The last week in June is commencement week at the University. We don't want to be cut off. I don't know but we might attend at that time, but it is somewhat questionable.

The President: The question now is upon the motion that we meet at some point on the Detroit or St. Clair rivers at some time in June, to be selected by the Executive Committee.

The motion was carried.

Mr. Wurzburg moved that the President appoint five delegates asked for in Mr. Oldberg's letter to the international meeting.

Carried.

Mr. Parsons: It has been customary to recommend the names of persons to the governor from which he may select a member of the State Board of Pharmacy and that has not yet been done.

Mr. Jesson: I move that all registered druggists and registered assistants in Michigan be asked to vote for a representative for that board, and I think it will result in increasing our membership.

President: You will prepare your ballots for the names of persons to be presented to the druggists of the State.

Mr. Colman: Pending that vote I would like to make a motion. I have been impressed with the painstaking and faithful manner in which our Secretary has performed his duties, and I wish to move that a vote of thanks be tendered him, and especially so as he has consented to perform the duties for another year.

Carried unanimously.

Mr. Parsons: I am sure I appreciate any expression of that nature. I am not satisfied with the work I have done, but acting upon the principle that I am glad to get anything I can, I am very glad to receive this expression.

The Secretary then read a communication from Prof. A. B. Stevens asking for contributions to the National Formulary.

Members of M. S. P. A.:

Once more your member of the National Formulary Committee, solicits your co-operation in making the N. F. a work that will be a credit to the profession and one that may come into daily use. Will you individually aid the committee by sending to the writer a list of such preparations as you would like to have added to the Formulary?

If I do not hear from you we will consider that you are satisfied with the work and recommend no changes.

Give us your aid and your ideas, and oblige,

Yours fraternally,

A. B. STEVENS.

The communication was ordered printed in the proceedings.

Mr. Colman moved that the names of Bassett, Brown, and Colman be stricken from the list because the localities which they represent are now represented on the Board.

Mr. Vernor: I move to amend, that names only of individuals from towns now represented on the Board shall be stricken out.

Carried.

Mr. James Vernor was then elected Local Secretary for the next year.

Prof. Prescott: There are a few more queries in the box.

President: They will now be read.

Prof. Prescott then read the following queries: —

What are the qualifications demanded of a boy who wants to work in a drug store?

Mr. Bassett: Sixteen hours a day. [Laughter.]

Mr. Dupont: The best answer to that is to refer to our last proceedings, to Mr. Eberbach's paper.

A unanimous vote was then given Mr. Colman for the satisfactory way in which he had performed the duties of president for the past year.

The tellers then reported the list of names voted on as candidates to be presented to the druggists of the State for the State Board of Pharmacy, as follows: —

A. Bassett, Detroit,
H. J. Brown, Ann Arbor,
H. G. Colman, Kalamazoo,
I. L. H. Dodds, Buchanan,
J. Jesson, Muskegon,
F. J. Wurzburg, Grand Rapids,
Geo. Mc Donald, Kalamazoo,
A. S. Parker, Detroit.
S. E. Parkill, Owosso,
L. Paulv, St. Ignace,
A. H. Webber, Cadillac.

Mr. Lever: It seems to me something ought to be done with the paper read by Prof. Prescott on the adulteration of laudanum.

Prof. Prescott: The only thing that could be done would be to offer a resolution.

Mr. Lever offered the following resolution: —

We desire to remind all our members that the custom of supplying low grade laudanum for domestic purposes is not only unprofessional but is liable to lead to dangerous overdoses as a result of wide variations in strength.

The Association then adjourned.

ENTERTAINMENTS.

Tuesday evening the Hazeltine & Perkins Drug Co. tendered the visitors a trip to Reed's Lake, including a lunch and boat-ride, all of which were thoroughly enjoyed. Wednesday forenoon the ladies of the gathering were taken in tow by the wives of local druggists on a trip to North Park and the Soldiers' Home. Wednesday afternoon the entire party took a special train to Ottawa Beach, where a boat ride on the Saugatuck and a dinner at the Hotel Ottawa followed. This feature was provided by the local druggists and was duly enjoyed, the party returning to the city about midnight on a special train.

In Memoriam.

E. W. BARTRAM, - - Paw Paw.

C. H. KIRKWOOD, - - Ishpeming.

APPENDIX.

A REVIEW OF THE CONTRIBUTIONS OF THE SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN FOR THE YEAR 1891-92.

Since the last meeting of this Association the contributions of the candidates for graduation in this school are such as may for convenience be classified as follows. In two instances the contributions of students in the Department of Literature and Science, in subjects related to the work of the School of Pharmacy, are included in this summary.

1. Pharmaceutical Preparations and Methods of Preparation. From the work of eleven students.
2. The Chemistry of Certain Alkaloids. From six workers.
3. Chemical Analyses of Medicinal Plants. Three contributions.
4. Drug Assays and Methods of Assay. From five contributors.
5. Operative Methods in Analytical Chemistry. Three reports.
6. Other contributions from four persons.

1. Pharmaceutical Preparations and Methods of Preparation.

All of the work done under this head was with the immediate direction of Professor Alviso B. Stevens, and was in the larger part undertaken to obtain answer to queries arising in his department of the school.

The Manufacture of the Pills of the U. S. Pharmacopœia, was the practical subject selected by Mr. Walter B. Cady.[1] The fifteen official pills were made in numbers of 200 to 250 each, by the U. S. Ph. formulæ. It was found that, for Pilulæ Antimonii Compositæ, the prescribed amount of glycerine was insufficient to effect the necessary adhesion. With this exception the directions of the pharmacopœia were not departed from, and the preparations, after keeping in the museum, will be subject to criticism.

The Manufacture of Oleates, Edward A. Grochau, was presented as a contribution at the meeting of the American Pharmaceutical Association, last month, and is to be published in the proceedings of that body for 1892.

Talcum, its Relative Value as a Filtering Base. Rudolph B. Carssow.[2] This investigation was instituted by Prof. Stevens, to determine the advisability of retaining talc as a filtering medium, as directed by the National Formulary. The report constitutes a paper separately presented at this meeting.

Preparations of the Constituents of Wheat and Bread. Mary K. Heard.[3] This is a fine cabinet exhibit of the prepared constituents of these staples, an object lesson of the components of the staff of life. The quantity of each constituent is not determined from the yield in preparation, but is adjusted to the averages drawn by König from analyses of two hundred and fifty specimens of various varieties of the grain. One kilogram of the staple is represented. The methods of preparation are detailed in Miss Heard's report but need not be given here unless called for. The loaf of bread is preserved unchanged by benzoic acid.

Preparations of the Constituents of Indian Corn. Leonard A. Seltzer.[4]

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[1] Mr. Cady, a resident of Ypsilanti, Mich., entered this school in Sept., 1890, then twenty-one years of age. He graduated as Ph. C. June 30, 1892, and has engaged as an assistant chemist in the New York State Agricultural Experiment Station, at Geneva, N. Y.

[2] Entered the School from Ste. Genevieve, Mo., Sept., 1890, at the age of eighteen, having had then two years in the service of Pharmacy. Graduated in June of this year. He has returned to his former home for the practice of Pharmacy.

[3] Miss Heard entered the school Sept., 1890, from North East, Pa., at the age of twenty-one. Received the degree of Pharmaceutical Chemist, June 30, 1892.

[4] Mr. Seltzer entered the University, Sept., 1890, at the age of twenty, from Joliet, Ill., and received the degree of Pharmaceutical Chemist, June 30, 1892. He is in pharmacy with Mr. F. W. R. Perry, 709 Woodward Ave., Detroit, Mich.

These are exhibits of actual preparations made in the laboratory and shown in the true average quantity, like those referred to in the paragraph last above. The oil is a product of especial interest, 4.46 per cent. of the maize, 1.9 per cent. of the wheat, in both cases a limpid and nearly inodorous fixed oil.

Preparations of Proximate Principles were made, also, by WILLIAM A. KELLY,[1] and by ALFRED E. SANDERS.[2] These present the true average quantity of the more important constituents of the several vegetable materials worked upon; namely, mandrake jalap, guaiac, mustard, pepper, cubebs, strychnos ignatia, strychnos nux vomica, and the caffeine-bearing plants. The following are some of the principles of special interest: from podophyllum, podophyllotoxin, podophyllic acid, and picro-podophillin. From jalap, convolvulin and jalapin. From cubebs, cubebin and cubebic acid. From black mustard, sinalbin, fixed oil, and the volatile oil produced during distillation. Caffeine is shown in its due proportion from coffee, tea, kola, and guarana, with the total tannins from each source.

Preparations for the Prescription Case, by JOSEPH J. WELLS[3] and JULIUS M. KLEIN,[4] include twenty-eight articles, such as galenicals and specialties, those of the National Formulary and the U. S. Pharmacopœia. In connection with their preparation of chlorodyne, they prepared a tabular summary of ten proposed formulas for this article, and its equivalents. This table is separately presented, with a discussion of the subject by Prof. Stevens, in a paper for this meeting.

The Liquors of the U. S. Pharmacopœia. By WALTER W. BRAND. These preparations are twenty-six in number, and were all made by the directions of the Pharmacopœia.

2. THE CHEMISTRY OF CERTAIN ALKALOIDS.

Investigations upon alkaloids have been carried along four lines, and have been continued throughout the college year.

1. *Alkaloids accompanying Berberine, their occurrence, chemical properties, and constitution.* Upon this subject MR. ROY D. YOUNG[5] has been engaged through the year, and MR. H. W. BIRKMIER[6] for a good part of the second semester. Mr. Young's report is entitled The Relationship of the White Alkaloids of Berberine-bearing Plants. It presents a history of the discovery of the colorless alkaloids in question, as given in chemical literature, namely, hydrastine, minispermine, coptine, and oxycanthine, with some account of the concluding work of Perkin upon hydrastine, and the relation of the latter to papaverine and narcotine. Mr. Young also gives account of a good deal of his own work with hydrastine, its reactions with analytical reagents, and its behavior in methods of separation from berberine. In this he reviews the reports of Hale, Burt, Serchen, as well as of Schmidt and Wilhelm, and institutes some experiments bearing upon the question of a "third" alkaloid from golden seal, or a conversion product of hydrastine, the results being apparently negative upon this question. Finally Mr. Young obtained control of the complete separation of minispermine, determined some of its reactions, and made the combustions to fix its formula, which appears to be $C_{32}H_{45}NO_6$. Mr. Young has also placed

[1] Mr. Kelly entered the school, Sept., 1890, at the age of twenty, from Ottawa, Ohio, having then had a year of service in the drug store of his father, in which he again engaged after his graduation last June.

[2] Mr. Sanders matriculated in Sept., 1890, from Fredonia, N. Y., then twenty-one years of age, and having had four years' experience in the business of pharmacy. He is now engaged at his former home.

[3] Mr. Wells entered the University, Sept., 1890, from Athens, Mich., at eighteen years of age. He graduated in June, 1892, and is now with I. E. Wells, druggist at Athens.

[4] Mr. Klein was admitted, Sept., 1890, at nineteen years of age, from Chelsea, Mich., and received his degree last June. He is now in pharmacy with R. S. Armstrong, Chelsea, Mich.

[5] Mr. Young entered the school, September, 1888, at the age of seventeen, from Belleville, N. Y. He received the degree of Ph. C. in June, 1890, and engaged as assistant chemist in the New York State Agricultural Experiment Station. In October, 1891, he re-entered the School for graduate studies, and June 30, 1892, obtained the second degree, Phar. M. He is to continue his studies in the School another year, while serving as assistant to the chair of pharmacy.

[6] Mr. Birkmier matriculated, September, 1890, at the age of twenty years, from Ottawa, Ohio, having then had three years of service in pharmacy. He graduated last June, and has engaged in pharmacy.

in the University Laboratory an Index to the Literature of Berberine, arranged under authors, with 253 entries, over the period from 1824 to 1891.[1] Mr. Birkmier's work was in support of that of Mr. Young, and more especially in preparation of a sufficient quality of minispermine, and the determination of its reactions. Mr. Young's report and the note of Mr. Birkmier, were read at the meeting of the American Pharmaceutical Association, last month, and will be published in the proceedings of that body for 1892.

The Alkaloids of Sabadilla were the subject of work by RICHARD FISCHER,[2] and *The Alkaloids of Viratrum Viride*, by WILLIAM E. SANDFORD,[3] the labors of both these students being under the supervision of W. F. Edwards, M. S., of the University. The literature of these subjects is extensive and somewhat intricate, but is well summarized in a history by Mr. Fischer, who has made distinct advancement in the methods of recovery of the alkaloids of Sabadilla, the yield of which, in his hands, was from 1.7 to 2.0 per cent of the seeds. Mr. Fischer's report is to be presented at the meeting of the American Chemical Society this month, and may then be looked for in the journal of that Society. Mr. Sandford's report presents a fairly good history of the work upon veratrum viride, but offers nothing new upon this subject.

The Iodomercurates of Organic Bases. LYMAN F. KEBLER.[4] This is a continuation of the investigation made by the undersigned several years ago.[5] For better control of analytical results, Mr Kebler made full ultimate analyses of his precipitates by Mayer's Solution. To do this a special method for combustion was adopted, after several trials, giving results for the mercury without interference with estimation of hydrogen and carbon. To gain information of the valence relations of the alkaloids to the mercury and the iodine, the iodomercurates of pyridine and quinoline were made and analyzed. The investigation has a two-fold interest, that is, for the better understanding of the volumetric estimations of the alkaloids, as well as for light upon the linkings of nitrogen in double salts of these bases. The paper is to be presented in the chemical section of the American Association for the Advancement of Science, at the Rochester meeting, this month.

Trimethyl-xanthine and Certain of its Derivatives is a designation of the subject upon which Mr. GOMBERG[6] has been for some time engaged. The determining purpose of this research is the inquiry into the chemical possibilities of isomerism between caffeine and theine or guaranine. Therefore the research is of immediate interest in pharmacy. It is, however, altogether in the methods of organic synthesis. The xanthine group, including at once certain food adjuncts of world-wide use, and certain fossil bodies of excrementitious origin abundant in the earth, has singular possibilities of manufacturing industry. Moreover the relation between xanthine and the uric acid group is of great physiological consequence. And while it is not yet accomplished to pass from uric acid to a xanthine derivative in laboratory operations it appears probable that such a chemical conversion has taken place in the guano beds. Again the study of the constitution of xanthine derivatives promises to give us a better understanding of the

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[1] A discussion of the molecular structure of berberine, and of the relationships of this alkaloid, with a critical history of Perkin's work thereupon, was read before the Chemical Society of the University of Michigan, by W. F. Edwards, M. S., a few months ago, and will appear in the journal of the American Chemical Society.

[2] Mr. Fischer matriculated, Sept., 1890, at the age of twenty-one, from New Ulm, Minn., where he had four years' experience in pharmacy, chiefly with Chas. L. Roos, Ph. C. of the class of '83. He graduated last June, and is to continue his studies next year in the University while acting as an assistant in analytical chemistry.

[3] Mr. Sandford entered the University, Sept., 1891, at the age of twenty, with advanced standing obtained by chemical studies for several years in Illinois Industrial University. He graduated in June of this year, and returns to the institution just named, in which he has been appointed a fellow.

[4] Mr. Kebler graduated in the School of Pharmacy in June, 1890, and in 1891, in the chemical course in Dept. Literature, Science and the Arts, in which he has just received the degree of M. S. He has now engaged as chemist for the manufacturing laboratory of Smith, Kline and French Co., Wholesale Drug Dealers, Philadelphia, Pa.

[5] A. B. PRESCOTT. "Estimation of Alkaloids by Potassium Mercuric Iodide." 1880: *Am. Chem. Jour.*, *2*, *294*; *Jour. Chem. Soc.* *42*, *684*.

[6] Moses Gomberg, B. S. (Chem.) 1890, M. S. 1892. Assistant in Organic Chemistry, University of Michigan.

pharmaceutical salts and halides of caffeine, more and more largely in common use.[1]

The duty of supervision of the labors above enumerated upon The Chemistry of Alkaloids, so far as not already stated to have been taken by others, has belonged to the undersigned.

3. CHEMICAL ANALYSIS OF MEDICAL PLANTS.

Analysis of Smilax Pseudo China, the Rhizome. BERT E. CODY.[2] This is the drug termed Bamboo Brier Root. The report is not a long one, and is offered for publication by this Association.

Constituents of Rhubarb. OSCAR C. PUSCH.[3] This work was not so much a plant analysis as a preparation of cabinet samples of the constituents of this drug. It is of especial interest because of the product, cathartic acid, of which Mr. Pusch obtained a good specimen. The paper is separately presented in full.

The Principles of Ergot were separated by MR. ROBINSON.[4]

4. DRUG ASSAYS AND METHODS OF ASSAY.

Assay of Angustura Bark. AMASA D. COOK.[5] Three samples of so-called Angustura Bark, in coarse powder, were obtained from drug stores in Ann Arbor, and subjected to inspection and experimentation. Samples 1 and 3 were destitute of the aromatic odor of angustura, and were extremely bitter. All three were assayed for total strychnos alkaloids, and separation of strychnine from brucine was instituted, with various comparative trials of methods of assay and of separation of the alkaloids from each other. For total alkaloids the Dunstan and Short method was employed. For separation of the one alkaloid from the other, the ferricyanide method was tried three times, and the method by dilute alcohol was tried, the latter with better success than the former, but the results were not of assured quantitative value. The outcome was as follows: No. 1, a "false bark," contains both strychnine and brucine, 2 5 per cent of both. No. 2, a true bark, contains neither brucine nor strychnine. No. 3, a "false bark," contains 3 1 per cent of total strychnos alkaloids in which strychnine and brucine were both present. These results are offered to the Committee on Adulterations.

Alkaloidal Valuation of Norwood's Tincture of Veratrium Viride, was the subject of MR. DRAKE'S[6] work. This is Query No. 46 of the A. P. A. list for the meeting of 1892. The results are retained for additional work.

The Morphine Strength of Laudanum as Supplied Generally in the State of Michigan. By ELLIOTT H. HAAG.[7] This series of assays of tincture of opium undertakes to supply some of the information called for at the last meeting, as recorded on pages 43 and 44 of the Proceedings of this body for 1891. The nature of the subject would justify me in contributing the report, from the School, to the Committee on Adulterations, but as the Committee on Papers has

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[1] A paper entitled "The Question of the Isomerism of Caffeine," written by the undersigned, was presented in the Section of Pharmacy of the American Medical Association, at the Detroit meeting in May. In this paper is a tabular summary of the percentage constituents of tea and of coffee, as beverages made in specified conditions, according to various published determinations, mostly by graduates of this University. The paper may be expected to appear in the Journal of the American Medical Association.

[2] Mr. Cody entered the school, Sept., 1890, at the age of twenty, from Indianapolis, Ind., and has now graduated.

[3] Mr. Pusch matriculated at eighteen years of age, from Marysville, Kansas, having had one year of service in pharmacy before that time. He took the degree of Ph. C. last June, and is now with B. F. Binswanger & Co., druggists, St. Joseph, Mo.

[4] Mr. Thomas E. Robinson entered the school at the age of twenty-two, from the Department of Literature and Science, as a resident of Charlotte, in this State. He graduated last June.

[5] A resident of Warren, Ohio. Entered the school in September 1890, at nineteen years of age, and received his degree in June of this year.

[6] Fred. F. Drake matriculated, Sept., 1890, from Rochester, Ind., at the age of eighteen years, and took his degree last June. He is in pharmacy with Wm. A. Zimmer, druggist at Manistee, Mich., and a former student of this School.

[7] Mr. Haag entered the School, Sept., 1890, at the age of twenty-one, as a resident of Napoleon, Ohio. He graduated, June 30, 1892. He has returned to his previous residence to practice pharmacy.

been responsible for the report, it may not be proper to shift this accountability. The report is offered as a paper by itself.

The Assay Methods of Lloyd and Thompson were put upon trial by MR. PATTISON.[1] This work, done under direction of Prof. A. B. Stevens, who read the paper at the meeting of the American Pharmaceutical Association a fortnight ago. It will appear in the Proceedings of that body.

Atropine, its Decomposition and Waste in the Assay Method of Dunstan and Ransom, was taken for work by MR. SHEEDY.[2] The paper is presented to this Association in full.

5. OPERATIVE METHODS IN CHEMICAL ANALYSIS.

Safety Tests for Kerosene, were experimented upon by MR. HARRIS E. ALLEN.[3] The experiments were to determine the influence of conditions of experimentation, and of different instruments, upon the flash point, and the burning point of illuminating oils. The results are retained for additional work.

The Recovery of Arsenic from Organic Matter. By GEORGE R. JACKSON.[4] This was an experimental inquiry into the limits of necessary loss in the quantitative determination of arsenic, in separating it from tissues, foods, etc. It is a continuation of a series of similar determinations published by the undersigned in 1885.[5] This addition will be prepared for publication ere long.

Modifications of Kjeldahl's Method for Estimation of Nitrogen. Messrs. MILLER[6] and SUTTON[7] carried this work in a series of experiments laid out by Prof. L. L. Van Slyke, chemist of the New York State Agricultural Experiment Station, and the results are reported to him for use in the Committee on Nitrogen Estimations, Association of Official Agricultural Chemists of the United States.

6. OTHER EXPERIMENTAL WORK.

Pepsin Digestion, the Extent in which it is Affected by Alcohol. BY OSCAR H. SOETJE.[8] This paper is presented in a separate form, without reduction.

The Properties of Morphine Sulphate as found in the Market. This subject was taken as that of M. S. P. A. No. 12, but was modified in direction by Mr. ATWOOD[9] who worked upon it. Investigations of solubilities, and amount of water of crystallization, were made with care. The results, however, are retained for further work.

Presence of Silver in Bismuth Subnitrate and Subcarbonate. GEORGE J. WARNER.[10] This subject is taken from Query No. 17 of the A. P. A. for last

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[1] George H. Pattison matriculated, at the age of twenty-two, in September, 1890, and graduated June 30, 1892. He has engaged himself in the manufacturing laboratory of Dr. Chapman, in Chicago.

[2] JOHN T. SHEEDY entered the University, at the age of twenty-one, from Worcester, Mass., and received the degree of Pharmaceutical Chemist, June 30, 1892. He then entered into service of the Wm. S. Merrell Chemical Co., as assistant chemist in their manufacturing laboratory, Cincinnati, Ohio.

[3] Entered the school at the age of eighteen, from Morenci, Mich., and graduated, two years later, as Pharmaceutical Chemist. Before his matriculation he had served in pharmacy one year, and since his graduation he has gone to work with Hurd & Gray, druggists, Detroit.

[4] Mr. Jackson entered this school, at the age of twenty-two, from Detroit. He had previously graduated as Bachelor of Arts in Oberlin College, and he took the degree of Ph. C. in June. He has engaged in pharmacy in Memphis, Tenn.

[5] Proc. Am. Assoc. Advan. Sci., 34, 109; Chem. News, 53, 78.

[6] Emerson R. Miller entered the school, at the age of twenty-nine, during the college year 1890-91, with some advanced standing, took the degree last June, and is continuing chemical studies in the University.

[7] John B. Sutton entered the school, Sept., 1890, at the age of twenty-five, graduated in June, and is in pharmacy with J. C. West & Co., Grand Rapids, Mich. He had been in the service of pharmacy before his matriculation.

[8] Mr. Soetje entered, September, 1890, at the age of nineteen, from Monticello, Iowa, and having then had eight years of experience in the business of pharmacy. He took his degree in June of this year, and resumes the practice of his profession at the place of his previous residence.

[9] DANIEL B. ATWOOD entered the University, September, 1890, at the age of eighteen, from Zanesville, Ohio, and graduated last June.

[10] Mr. Warner entered from Birmingham, Mich., at the age of twenty years, graduating on June 30, 1892. He is engaged in Birmingham.

meeting, but the report was not ready in time for that body. The work was in charge of Professor Johnson, who has already reported upon this subject for publication (*Mich., State Pharm. Assoc., Proceedings, 1885, p. 148; Pharm. Record, 5, 420*). A pretty full discussion of the analytical methods of the work is made by Mr. Warner. He obtained *eight* samples of subcarbonate of bismuth, and *nine* of subnitrate, all which were supplied by Lehn & Fink, of New York, directly from the several manufacturers of these articles. All the samples except *one* of the nitrate, under analysis, revealed traces of silver, but in no instance was a weighable quantity of this metal present. Each operation was made upon 2 grammes of the sample operated upon. These results, as I have summarized them, concern impurities, and are perhaps due to the Committee upon Adulterations.

Sulphur Soaps. By JAMES H. PARSONS.[1] This report is offered as a separate paper. A. B. PRESCOTT.

[1] Entered the University, September, 1890, at twenty-one years of age, having resided in Detroit. Graduated June 30, 1892, and entered into service as chemist of the alkali works at Wyandotte, Mich.

TALCUM; ITS RELATIVE VALUE AS A FILTERING MEDIUM.

BY R. B. CARSSOW.

Talcum, because of its uses as a filtering medium and occurring in its many varied forms, caused me to inquire if the different forms were equal in value to each other and to other substances used as filtering bases. Talcum is extensively used in the manufacture of the elixirs of the *National Formulary*, and some claim that it might be used in the preparation of the waters of the U. S. P. Talcum is known under several commercial names, as French chalk, talc, Venetian talc, steatite, and is sometimes incorrectly called soap-stone. It is widely diffused in nearly all countries and is found in large quantities in Austria, Shetland Isles, Sweden, Bohemia, and New Jersey, and varies in color and the amount of impurities present. The two varieties used in this work are known commercially as French chalk and Venetian talcum. The two varieties of talcum were subjected to the various methods of purification. Elutriation was used in two cases to separate the coarser from the finer particles, but as this method possesses no special advantage it was abandoned. The various methods of purification differed principally in the amount and strength of the acid used and in the length of time employed in digestion and boiling the talc with the acid. After having tested all of the methods I have arrived at the following conclusions:—

1. That Venetian talcum should not be used for pharmaceutical purposes as it contains a large percentage of impurities that cannot be removed by any practical method of purification.

2. That no dependence is to be placed upon the so-called purified talcum of the market, as the greater proportion of it is doubtless nothing more than commercial white talcum.

3. That the formula given in the *National Formulary* answers all the requirements when good French chalk is used.

For comparison of the different media a large number of aromatic waters were prepared by various methods, but those oils principally used, were those recommended in the manufacture of the elixirs of the *National Formulary*. The greater number of experiments were made with oil of cassia, a portion of which will be given in this paper and may be tabulated as follows : —

CINNAMON WATER.

Method used.	Reaction.		Clearness.	Residue in. 1000 c. c.	+ Acetic Acid.	+ Alkaloids.
	Fresh.	End 1 mo.				
Talcum Purified N. F.	neutral.	neutral.	not clear.	0.22 gm.	precip.	precip.
Talcum Purified Com.	neutral.	alkaline.	.....	.....	precip.	precip.
Cotton Old Oil.	acid.	acid.	perfectly cl'r.	.086 gm.	precip.	.....
Cotton Fresh Oils.	acid.	acid.	perfectly cl'r.	.....	no prec p.	no precip.
Mag. Carb. Old Oil.	neutral.	alkaline.	not clear.	0.22 gm.	precip.	precip.
Mag. Carb. Fresh Oil	neutral.	.....	perfectly cl'r.	.....	no precip.	no precip.
Distillation from Bark	acid.	.....	clear.	.....	no precip.	no precip.

The large residue obtained on evaporating, especially those portions that were prepared by the cotton process, led the writer to investigate the nature of the oil used. A small portion of the oil evaporated on the water bath left a large residue which on further investigation proved to be colophony.

The precipitate formed by the solution of the alkaloids is evidently due to the adulterant in the commercial oil rather than to the method of manufacture, as no

[1] Watery solutions of the salts of six different alkaloids were used and were those employed in the manufacture of elixirs or those that are apt to be prescribed with elixirs.

[2] Fresh oil distilled from the bark.

precipitate was formed by treating a saturated solution of carbonate of magnesia with the alkaloidal solutions. However a precipitate was formed by treating a solution of colophony (formed by triturating colophony and magnesia carbonate with water) with the alkaloidal solutions. The colophony solution was also precipitated by acetic acid. When the various methods were used in the manufacture of the elixirs, they stood in the following order: Magnesia carbonate, 1st; Purified Talc N. F., 2d; Purified Talc com., 3d; Paper Pulp, 4th.

The aromatic elixir prepared with magnesia carbonate, was clear and sparkling, becoming slightly alkaline on standing, but on mixing with a solution of the alkaloids and allowing to stand one month, no appreciable precipitate was produced.

[From Mr. Carssow's experiments, it would appear that the precipitation of the alkaloids by waters or elixirs prepared with magnesia carbonate has been greatly exaggerated. Doubtless a slight precipitation will occur in some cases; even this may be entirely prevented by adding a sufficient quantity of acid to render it either neutral or slightly acid. If the oil is old or adulterated with resin the acid may produce a precipitate. So valuable a filtering medium as magnesia carbonate ought not to be discarded on so slight a cause. A. B. S.]

CHLORODYNE AND SIMILAR PREPARATIONS.

BY A. B. STEVENS.

During the last decade various mixtures of chloroform, morphine, capsicum, etc., have come into common use under various names, as chloranodyne, mistura chloroformi et opii, tinctura chloroformi et morphinæ, etc. By comparison of the various formulas in the accompanying table compiled by Messrs. Wells and Klein, it will be seen that there is a great variation in the strength of the more active constituents. It is evident that a preparation so universally used, should be uniform in strength. This was evidently the idea of the British when they introduced the preparation *tinctura chloroformi et morphinæ* and in a foot note stated that it was a substitute for Brown's chlorodyne. They doubtless attempted to make a preparation not only similar in properties but in appearance, to the original.

Our own *National Formulary* Committee aimed at uniformity by introducing a preparation under the name of *Mistura Chloroformi et Opii*, which is a modification of the British tincture of chloroform and morphine.

This preparation forms a mixture which separates on standing, and, according to the directions, should be shaken before dispensing. In this respect it differs from the preparations found on the market, which are perfect solutions.

The writer would offer the following as a substitute: —

Chloroform	2 fl. oz.
Ether	½ fl. oz.
Tr. Cannabis Indica	2 fl. oz.
" Capsicum	1 fl. oz.
Sulphate of Morphia	18 grs.
Oil of Peppermint	16 minims
Hydrocyanic Acid Dil.	1 fl. oz.
Glycerine	2 fl. oz.
Water	1 fl. oz.
Alcohol enough to make	16 fl. oz.

This forms a perfectly clear solution of about the same medicinal strength as those of the *N. F.* and *Br. Ph.* and more nearly resembles the commercial article.

The writer does not present the formula for use at this time but with the hope that it will elicit a free expression of opinion that will be beneficial to the *N. F.* Committee.

CHLORODYNE AND SIMILAR PREPARATIONS.—By J. J. Wells and J. M. Klein.

Ingredients.	N. F. Mistura Chloroformi et Opii.	Br. Dis. Tinctura Chloroformi et Morphinæ.	Philadelphia Method.	Hungarian Phar. Chlorodyne.	London Chlorodyne.	Mattbie's Formula, Chloranodyne.	Chandler's Formula, Chlorodyne.	Page 266, Vol. XI, New Remedies, Chlorodyne.	Page 9, Vol. X, New Remedies, Chlorodyne.	Chlorodyne.	Chlorodyne. English Method.	Chlorodyne. Method.
Chloroform (Pure)	2 fl. oz.	2 fl. oz.	3 fl. oz.	2 fl. oz.	5 fl. dr.	2 fl. oz.	1 fl. oz.	1 fl. oz.	6 fl. oz.	1½ fl. oz.	1.5 fl. oz.	1½ fl. oz.
Oil Peppermint	16 min.	8 min.	32 min.		95 gtt.	24 min.	32 min.	24 min.	12 min.	72 min.	15 gtts.	24 min.
Tr. Cannabis Indica	2 fl. oz.		2 fl. oz.	ext. 24 grs		2 fl. oz.	1 fl. oz.		ext. 24 gr	1½ fl. oz.		1½ fl. oz.
Ext. Cannabis Indica					64 grs.							
Tr. Soap Bark (N. Fr.)	2 fl. oz.											
Fl. Ext. Belladonna	128 min.											
Tr. Opium Deod	2¾ fl. oz.											
Tr. Capsicum	1 fl oz.		oleoresin. 16 min.		64 grs. oleoresin.	60 min.	64 min.	3 fl. oz.	½ fl oz.	1½ fl. oz.		
Ext. Licorice (Pure)	240 grs.	(liquid) 2 fl. oz.						fl. ext. 1 fl. oz.			sr. 8 fl. oz. ex. 46½ gr.	
Water	½ fl. oz.		1 fl. oz.									
Syrup	q. s. 16 fl. oz.	q. s. 16 fl. oz.			q. s. 16 oz.				6 fl. oz	8 fl. oz.		
Ether		4 fl. dr.						½ fl. oz.		1½ oz.	½ fl. dr.	
Alcohol		2 fl. oz.	8 fl. oz.			6 fl. oz.	5 fl. oz.	4 fl. oz.	1 fl. oz.		90 per ct. 4 fl. oz.	q. s. 16 fl. oz.
Morphine Hydrochlorate		16 grs.	128 grs.			64 grs.	32 grs.		25 grs.	72 grs.	125 grs.	46 grs.
Morphine Sulphate					32 grs.			20 grs.				
Dilute Hydrocyanic Acid		1 fl. oz.	U. S. P. 192 min.			4 fl. dr.		½ fl. oz.	1 fl. oz.	2 2-5 fl. dr.		2½ fl. oz.
Hydrochloric Acid			1 fl. oz.							¾ fl. oz.		
Tr. Aromatic											tr. ar. & opm. sim. ½ fl. oz.	
Tr. Ginger				6½ fl. oz.								
Tr. Aconite										3 3-5 fl.dr.		
Tr. Hyoscyamus										3 3-5 fl.dr		
Tr. Cardamom (Comp'd)								1 fl. oz.				
Acetic Ether				q. s. 16 fl. oz.								
Chloric Ether									1 fl. oz.			
Oil Bitter Almond											3 min.	
Oil Cherry Laurel									6 min.			
Syr. Orange Peel				2½ fl. oz.								
Glycerine						q. s. 16 fl. oz.	q. s. 6½ fl. oz.	q. s. 16 fl. oz.				

ANALYSIS OF SMILAX PSEUDO-CHINA. RHIZOME.

BY B. E. CODY.

Smilax Pseudo-China Rhizome, (Linne). N. O. Smilaceæ: Habitat, New Jersey to Kentucky and south. Synonyms, Virginia Sarsaparilla, Bamboo Brier Root.

This plant was first called to my attention by Eli Lilly & Co., of Indianapolis, who gave me the drug to work upon. It is a comparatively new drug and its preparations have proven valuable medicines. It is used as an alterative and tonic, while its extract compounded with other extracts is used in syphilis. The fluid extract of Bamboo Brier Root, fluid alterative compound, solid extract alterative compound and pill alterative compound are the preparations of this drug manufactured to date.

My first investigation of the drug was made qualitatively, using twelve hundred grammes of the rhizome, reduced to No. 30 powder. This was allowed to macerate five days with 94 per cent ethyl alcohol and about 1.5 per cent hydrochloric acid, and at the end of that time the whole drug was completely exhausted with the same menstruum. The resulting fluid extract was of a bright cherry-red color, and pleasant odor. This extract was finally concentrated to a syrupy consistency and then thrown into 3500 c. c. of water of about 26° C. and acidulated with hydrochloric acid. A dark reddish brown precipitate was thrown down from the solution, leaving a dark cherry-red solution. This solution was filtered and concentrated without changing its color.

The precipitate contained the oils, resins, also a reddish brown principle insoluble in ether, chloroform, or acids, but soluble in alkalies and alcohol to a red solution.

The first filtrate was then rendered alkaline with ammonia hydrate, which caused the precipitation of a blackish principle, and the resulting liquid was colored dark brownish black. This precipitate was soluble in acids and alcohol, insoluble in ether, chloroform, or alkalies.

These two principles are entirely opposite in chemical relations, and precipitation, respectively, by acids and alkalies, while they resemble one another in their solubilities.

The acid precipitated principle has a reddish brown, shiny, granular appearance when dried, tasteless, and odorless. The alkali precipitated principle is blackish brown, mealy when dried, almost tasteless, sweetish sickening odor. When moistened these two principles have a peculiar sour smell. Both together exist to the extent of 5 per cent to 7 per cent of the drug. Combined with the oils and resins they constitute the active portions of the drug, for the alkaloid which I discovered and shall call Bambine is contained in the drug to about 0.014 per cent to 0.021 per cent.

The two principles above spoken of shall be referred to as Alpha-Bambin and Beta-Bambin. The former one, the acid precipitated principle, the latter the alkali precipitated principle. The resin contained in this rhizome is of a dark brownish black color, sticky, almost tasteless, and having an aromatic odor. The fixed oil is dark brown, thick, heavier than water, and has a disagreeable odor.

The volatile oil has a pleasant aromatic odor, but is present in very small quantities.

The alkaloid bambine is amorphous, has an oily appearance, with a disagreeable odor like that of mold. It is soluble in acids, and reprecipitated by alkalies. When treated with picric acid it gives a yellow precipitate, with Mayer's reagent, a yellowish white precipitate, and with iodine and potassium iodide, it gives a deep reddish brown precipitate. It is also precipitated by all the other alkaloidal reagents, and acts in every way as a true alkaloid.

The plan of my work was based upon Dragendorf's Method of plant analysis, and I followed it closely as possible. My quantitative analysis of this drug is the determination of the most essential parts in detail.

At the present date I have been unable to find an account of any one who has made an analysis of the drug, consequently my results are entirely original.

The amount of the drug worked upon quantitatively was 10 grammes of the No. 30 powdered rhizome.

	Per Cent.
Moisture (possibly a little trace of volatile oil)	7.19
Ash	3.53
Ethereal oil	.05
Fixed oil	.21
Resin total	.31
Alkaloid Bambine	.014 –.021
Alpha-principle or A-bambin	3.33
Beta principle or B-bambin	1.25
Tannin	.385
Insoluble fiber	82.231
	99.000

SULPHUR SOAPS.

BY J. H. PARSONS.

Of the many varieties of sulphur soap found on the market I selected six for my analyses : three of them are very common and found in nearly every drug store, two being not so commonly met with, and the last one quite a curiosity in that it is rarely found on the market, as well as for its dark brown color and petroleum-like odor.

These soaps are each sold at retail for twenty-five cents, some closely wrapped and protected from atmospheric influences, while others are not so carefully preserved.

I first determined the per cent of water and volatile matter by taking 5 gm. of the soap in fine shavings and drying them with low heat at first, gradually increasing to 100° C., till they ceased to lose weight.

A. H. Allen, in his *Commercial Organic Analysis*, Vol. 2, states that all the water cannot be driven off at this temperature, and that in order to drive off all the water the heat must be raised to 120° C. or even higher but by doing this the soap is apt to melt, thus making an analysis inaccurate. By this means 4.5 per cent of water and volatile matter was found in sample 1. Following out Allen's scheme for analysis of soaps, I placed this dried soap in a Soxhlet tube and extracted with petroleum ether, thus extracting the unsaponified fatty acids, but upon allowing this extraction to continue some time in order to insure complete exhaustion I soon saw a fine precipitate forming on the bottom and sides of the receiver. Upon examination it was found to be free sulphur, which owing to slight solubility of sulphur in ether, had after repeated extraction come through in sufficient quantities to appear in the receiving flask. I at once thought that by running the extraction long enough I could extract all the sulphur, but the sample under analysis being too large for that I prepared another of 1 gm. and tried to carry out my idea. After allowing the extraction to go on for six hours, the percolate being perfectly clear I concluded that the end of extraction was reached. I next added $\frac{n}{10}$ KOH in alcohol to the percolate to saponify the free fatty acids, thus having the solution in condition for filtering out sulphur. I weighed the sulphur and found quite a considerable quantity. I then decomposed the soap found in the solution with a little H_2SO_4, cooled the liberated fat, and after washing weighed it on counterpoised filters, this giving 0.6 per cent.

Then treated the residue left in the percolator with hot water to dissolve the soap and leave the insoluble matter. I found a large quantity of insoluble matter still remaining and that with the sulphur which had already gone through would make quite a large percentage of insoluble matter. Upon examination I found the insoluble matter to consist entirely of sulphur, it all dissolving in CS_2, leaving not the slightest residue.

From this I concluded that Allen's method would be much too long and impracticable for sulphur soaps, whereupon I tried other solvents but to no avail, for sulphur, though stated to be insoluble in many reagents, is just enough soluble to contaminate the extract.

I at once set about to devise a scheme whereby I could estimate the sulphur (free) first, and then leave the sample in condition for general analysis of soaps. I took 3 gms. of the soap and dissolved in hot water, thinking by this means to separate the soap from the free sulphur by filtration, but I could not filter, owing to the heaviness of the liquid.

I took another sample of 1.289 gms. and dissolved in cold water and added a little alcoholic KOH to saponify the free fatty acids. This solution filtered very easily and after thoroughly washing the sulphur and drying I weighed.

Weight of free sulphur from 1.289 gm. = .4178 gm. = 32.5 per cent. I then decomposed the soap solution with HCl, cooled, decanted, and washed the free fatty acids, liberated and added the washings to the filtrate. This solution I tested for sulphates and sulphides but could find neither, thus proving that the sulphur added to the soap was free and did not oxidize. To make sure that all the sulphur was obtained by this method, I took 10 gm. castile soap, to it added 1 gm. pure sulphur, previously heated, mixed them thoroughly and of this mixture weighed out 2 gm. and treated as above, obtaining 10 per cent. the amount which I added.

In every sample of soap, of which I had six, I found a little free fatty acid, thus showing a point in favor of the soap.

The first sample which I analyzed and which contained the larger per cent. of sulphur (32 per cent.) is that found most abundantly on the market, e. g. Glenn's sulphur soap. It is the color of sulphur, not glossy inside or out, as is the case with some of the other samples. Upon examination by the microscope I found the sulphur without structure and not appearing at all like the sublimed or precipitated but more like the roll sulphur ground finely.

Sample No. 2, which is very glossy both inside and out, not quite so yellow in color, but highly scented, contained by the same method of treatment only 6 per cent. of water, a little free fatty acids and 6.96 per cent of free sulphur, contained no sulphates or sulphides. The third sample from an unknown source contained 5.2 per cent of water and 2.9 per cent of free sulphur, a trace of free fatty acids, no sulphates and no insoluble matter.

This soap was covered with a light powder and rather brownish color internally. Contained no sulphates or sulphides.

Sample No. 4, also from an unknown source, contained 4.7 per cent water, and 2.5 per cent of free sulphur, also a trace of free fatty acids, no sulphates or sulphides. This sample also was covered with a white powder; probably oxidation had taken place at the surface, yellowish brown internally, and dull, not bright as was the case with No. 2. Contained 80 per cent of fatty acids combined.

No. 5, still darker than the rest, contained 4 per cent of water at 100° C. and but 3.3 per cent of free sulphur. Although this sample had a nice appearance and odor of much sulphur, the per cent of free sulphur is much too low for any medicinal use. I found no sulphates or sulphides.

The sample No. 6 had a very dark brown, nearly black, color and a peculiar odor resembling tar. Contained but 3 per cent of water and no free sulphur could be obtained by this method. I could find no sulphates or sulphides and also no free fatty acids. The soap was completely soluble in cold water giving the liquid a dark brown color. When HCl was added and the fatty acids cooled the cake was very dark brown with petroleum odor.

These samples were all some weeks old, and only two were closely protected from the air. This would cause the per cent of water to become less and less till a point of equilibrium was reached, when no more would go off without artificial heat, for at the time of manufacture they all probably contained much more water and a proportionately less per cent of sulphur. It is a question whether sulphur, even so high as 32 per cent, applied in this form with so much water, would have any action upon the skin.

ATROPINE: ITS RECOVERY UNDER ASSAY CONDITIONS, AND LIABILITY TO DECOMPOSITION.

BY JOHN T. SHEEDY.

In 1891, a thesis was presented at this school, by A. W. Adams, Ph. C., entitled, "Limits of Recovery of Atropine from Belladonna."[1] Belladonna leaves were assayed by the process of Dunstan and Ransom, 1885: *Phar. Jour. Trans.* [3], *16*, 237. After determining, by several assays, the amount of alkaloids that could be extracted from the leaves, a definite quantity of atropine was added and the mixture assayed. There was a resulting loss of 46⅝ per cent of atropine. The large loss was thought to be occasioned by the abstraction of the alkaloid by the chloroform used in washing the acidulated solution, in order to free it from chlorophyll and other inert matter. Accordingly, the chloroformic chlorophyll solution was washed with acidulated water as suggested by Dr. Squibb: 1885, *Ephemeris*, *2*, 849. By this treatment, the loss of alkaloid was reduced to 32 per cent.

Before proceeding, it might be well to outline the Dunstan-Ransom method. Twenty gms. of dried and finely powdered leaves are packed in a continuous extraction apparatus and exhausted with 100 c. c. of absolute alcohol. The alcoholic liquid is diluted with an equal volume of water, slightly acidulated with hydrochloric acid. The liquid is gently warmed and the chlorophyll, fat, etc., are removed by extraction with chloroform until nothing more is removed by this solvent, and the aqueous liquid is then made alkaline with ammonia and the alkaloids extracted by chloroform. The chloroform solution is evaporated and dried at 100° C. to constant weight. This process on first consideration, appears to be quite simple and complete, but, on closer examination, there arises an objection that some alkaloidal matter might be abstracted and retained in the chloroform chlorophyll solution. This difficulty is partially obviated by washing the chloroform solution with acidulated water. Yet under these favorable conditions a loss of 32 per cent of alkaloid was reported. A possible explanation for this loss seemed to be in the decomposability of atropine under continued heat. A glance at the literature of the decomposition of atropine is interesting.

Prof. Flückiger (*Pharm. Ztg.:* 1886, March 20, 500. *Report Prog. Phar. Proc. A. P. A.* 1886, p. 613) states that atropine is decomposed by long heating with water in a closed tube at 100° C. Selmi found that atropine suffered decomposition when boiled with dilute sulphuric acid or with a solution of tartaric acid. (*Gazz. Chim. Ital: 6*,153 : Abstracts, *Jour. Chem. Soc.:* 1877, *31*, 93.) Pesci reports that by strongly heating atropine, picric acid was obtained, and also, that when brought in contact with fuming nitric acid, an oily base was formed. (*Gazz. Chim. Ital.: 10*, 425. *Jour Chem. Soc.:* Absts. 1881, 40, 293.) Ludwig and Pfeiffer obtained benzoic acid and propylamine by treating atropine with potassium chromate and sulphuric acid. (*Pharmacographia.*) Atropine is also decomposed by strong hydrochloric acid, caustic soda or baryta water. (*Pharmacographia.*) The products of decomposition are tropine, $C_8H_{15}NO$, and tropic acid, $C_9H_{10}O_3$.

Tropine is a strongly alkaloidal body, readily soluble in water and alcohol. Neither tropine nor tropic acid is present in leaves or root of belladonna. Tropine, itself, has no action on the pupil unless an atom of hydrogen is replaced by an acid radicle : this action is dependent on the nature of the radicle, as belladonnine or benzoyl tropine has not as powerful an effect as atropine or tropine tropate. [Buckheim (*Jour. Chem. Soc. Absts. 32*, 197. *N. Rep. Pharm. 25*, 344.)] It, therefore, seemed probable that under the prolonged heating necessary for complete extraction, some of the atropine might suffer decomposition. If decomposition were to take place, it would be necessary to inquire whether this decomposition would interfere with the accuracy of gravimetric or volumetric assay. If the products of decomposition behaved in the same manner as atropine and its salts toward the reagents employed in volumetric or gravimetric work, there would be no vitiation of the results of assay : if they did not behave in the same way, the results would be inaccurate.

[1] Proceedings Mich. State Phar. Assoc., 1891, Vol. 9, p. 75.

It was necessary, first, therefore, to determine whether any decomposition would be detected by reaction with the general reagent for alkaloids, Mayer's Reagent. Accordingly, 0.3000 gram of atropine was heated for three hours, at 58°–60° C. with a saturated solution of baryta water, in a flask with an upright condenser. The barium was then removed by the introduction of carbon dioxide gas and the solution filtered, and filter washed. The filtrate was then rendered slightly acid with hydrochloric acid and made up to a volume of 100 c. c. Of this amount 25 c. c. were taken and titrated with $\frac{n}{10}$ Mayers Reagent, requiring 0.3 c.c. for complete precipitation. This experiment was repeated twice with no perceptible variation in result. 0.300 gm. atropine was now dissolved in slightly acidulated water and made up to 100 c. c. On titrating with Mayer's Reagent $\frac{n}{10}$, as before, 11.9 c. c. were required for the precipitation of 25 c. c. of the solution. On calculation from Dragendorff's table (*Lyons' Manual Phar. Assaying*, p. 30), it was found that 12 c. c. M. R. would be the proper amount, so allowing for possible difference in conditions of titration, the atropine used gav evidence of being pure. This great difference in the action of Mayer's Reagen towards atropine, in comparison with its decomposition products, would show the presence of any decomposition products in the assay.

An experiment was now made to discover if, under exposure to a higher heat and under stricter conditions than would arise in the Dunstan-Ransom process, any of the atropine would undergo decomposition.

For this purpose, 0.300 *Gm.* Atropine was dissolved in 100 c.c. alcohol (S. G. 0.82), and boiled on the water-bath for two hours. The solution was then evaporated on the water-bath to a volume of 50 c.c., and 100 c.c. of 1 per cent sulphuric acid added. The entire solution was now evaporated on the water-bath until every trace of alcohol had disappeared: the solution was then allowed to cool and its volume brought up to 100 c. c. with water. Titration with Mayer's Reagent failed to discover any loss of alkaloid.

Messrs. Dunstan and Ransom, *Phar. Jour. Trans.*: 1883–4 [3], 14, 623, in the assay of Belladonna Root, state that in order to determine whether or not any of the atropine was decomposed at a high heat, they boiled atropine for six hours in an apparatus with an upright condenser, with a mixture of equal volumes of absolute alcohol and chloroform. The solution was then agitated with dilute sulphuric acid and the alkaloid recovered from the acid liquid by making alkaline with ammonia and shaking out with chloroform. Very close recoveries were made as follows: 0.085 *Gm.* Atropine was taken and 0.084 *Gm.* recovered: 0.221 *Gm.* Atropine was taken and 0.217 *Gm.* recovered. These experiments seemed to show that causes other than decomposition of the alkaloid were to be sought.

Great difficulty was experienced in obtaining complete extraction of the drug. In two assays, the repercolation was continued on the water-bath for about twelve (12) hours, before the fluid came over in a pale straw color. Owing to the great penetrating power of the alcoholic menstruum, the cork fittings early become saturated with vapor, retarding percolation, and causing possible loss of vapor. When the assay was allowed to run for a less time (six to six and one half hours), the percolate came over at the end but little less dark in color than when the assay was started. Using an ordinary length of time for extraction, it seems hard to believe that the atropine is completely separated from the leaves, as is claimed by Dunstan and Ransom. Undoubtedly, also, there is a large loss of atropine caused by washing with chloroform, for, in spite of carefully washing the chloroform with acidulated water, it seems probable that some atropine is carried away, intermingled with the chlorophyll and inert matter. And where there is an extraction possible, of 0.4 per cent to 0.7 per cent, the loss of a few milligrams will create a large percentage of loss.

The results obtained from assays, were hardly less favorable than those of Mr. Adams. It seems very reasonable to suppose that the great difficulty encountered in entirely freeing the alkaloid from chlorophyll, fat, etc.; the repeated washings made necessary, and perhaps incomplete extraction obtained in an assay of the length of time employed in a laboratory, furnish an explanation of the loss of alkaloid incurred.

MORPHINE STRENGTH OF LAUDANUM AS SUPPLIED GENERALLY IN THE STATE OF MICHIGAN.

BY E. H. HAAG.

The method used in this assay work was that of the U. S. Pharmacopœia of 1880.

The assays have been made as follows:

1. The specific gravity was determined by weighing in a specific gravity bottle at a temperature between 17° and 21° C.

2. The solid residue was determined by evaporating a known volume of the laudanum to dryness on a water bath in a small beaker and then drying to constant weight in a hot air oven at a temperature not to exceed 100° C.

3. The morphine was determined as follows: 75 cubic centimeters of the laudanum were evaporated to dryness on water bath; on cooling 75 cubic centimeters of distilled water were added together with 3 grams of powdered water-slacked lime. Thorough admixture was attained by trituration at intervals, during half an hour. The morphine was thus readily dissolved.

The liquid was then filtered from the meconate of lime and other insoluble substances, and 50 cubic centimeters of the filtrate, (representing 50 cubic centimeters of the original laudanum) were placed in an assay flask for further treatment.

To the above mentioned liquid were added in succession, alcohol, 5 c.c.; ether, 25 c.c.; ammonium chloride, 3 grams; and the mixture was well shaken in the corked flask several times during the first half hour.

The soluble compound of lime and morphine was broken up by the addition of the ammonium chloride, the result being the liberation of the morphine, and of free ammonia, and the production of soluble calcium chloride.

The free morphine was nearly insoluble in the ether saturated mixture, and gradually separated in small light colored crystals.

After twelve or more hours standing, these crystals were gathered on a small counterpoised filter, slightly washed with cold water, and dried at 70° C. – 90° C., and weighed.

This is the process of the U. S. Pharmacopœia of 1880 for the assay of opium. It is rapid, simple, and accurate, providing the lime is well burned, and the directions of the pharmacopœia are carefully followed.

Experimenting quite a little in the assay of opium before beginning the assay of the samples, shows that by using 3 grams of lime and a like amount of ammonium chloride, quite accurate results are obtained; the morphine seems to be of a purer quality than that obtained by other methods.

Mr. H. B. Parsons of New York claimed that his experience has shown that this method does not fall more than .1 to .2 per cent below the actual morphine content of the sample.

The Pharmacopœia of 1880 requires that powdered opium shall be used in the manufacture of laudanum, that would be one avoirdupois ounce of powdered opium to ten avoirdupois ounces of finished product. (As all parts in the U. S. Pharmacopœia are by weight unless specified otherwise.)

It also requires that powdered opium shall contain not less than 12 per cent nor more than 16 per cent of morphine, the weakest would then contain not less than 5 grains, and the strongest not over 7 grains of morphine to the ounce.

Here appended is a table showing the number of grains in each fluid ounce of laudanum if made from different amounts or different grades of opium: —

Per Cent in Morphine.	9	10	11	12	13	14	15	16	17	18
1 av. oz. to 10 oz. tr. U. S. P.				5.2	5.6	6.1	6.5	6.9		
1 tr. oz. to 10 " " "				5.7	6.2	6.7	7.2	7.6		
1½ tr. oz. to pint	3.3	3.7	4.1	4.5	4.9	5.2	5.6	6.0	6.4	6.8
1½ av. " " "	3.1	3.4	3.8	4.1	4.4	4.8	5.1	5.5	5.8	6.2
1 tr. " " "	2.6	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4
1 av. " " "	2.5	2.7	3.0	3.3	3.5	3.8	4.1	4.4	4.6	3.1
⅝ tr. " " "	1.6	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.2	3.4
⅝ av. " " "	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.8	2.9	3.1

From an inspection of this table in connection with the assays of the laudanum here presented it appears:—

1. That 23 samples were probably made from gum opium containing 9 per cent of morphine; in this are included all containing over 3.3 and under 4 grains of morphine to the ounce.

2. Those below this have been made with careless methods, or from a low-grade quality of opium, or diluted purposely to make the so-called family laudanum.

The forty samples were obtained from 12 different cities of Michigan, including the larger cities. From the method of purchase, it would appear probable that, if a separate grade of "domestic" laudanum were in stock, it would be obtained in this purchase. Two of the samples were manufactured in Detroit but sold at other places.

Number.	Specific gravity.	Temperature.	Weight of fl. oz	Per cent of solid.	No. of grains to fl. oz.	Per cent of morphine.	Grains of morphine to fl. oz.
1	.9509	19	433.325	3.402	14.741	.5146	2.219
2	.9451	19	430.712	7.679	33.074	.5029	2.166
3	.9508	19	433.279	4.895	20.949	.8684	3.762
4	.9512	19	433.461	4.096	17.773	.7768	3.367
5	.9448	19	430.545	6.388	27.481	.8816	3.793
6	.9418	19	428.950	4.100	17.596	.1957	.8398
7	.9501	21	432.960	4.640	20.084	.7838	3.169
8	.9405	18	428.565	4.237	18.158	.6690	2.867
9	.9503	18	433.006	4.591	19.879	.4806	2.081
10	.9460	19	431.092	4.963	21.394	.5546	2.390
11	.9461	19	431.137	5.174	22.307	.6395	2.757
12	.9454	18	430.818	6.452	27.784	.7449	3.209
13	.9500	18	432.915	4.731	20.697	.3706	1.604
14	.9688	18	439.208	5.234	22.987	.5516	2.422
15	.9575	18	436.332	5.571	24.308	.5574	2.432
16	.9815	17	447.269	5.482	24.563	.6974	3.118
17	.9651	17	439.696	4.998	21.954	.9525	4.188
18	.9412	17	428.904	6.265	22.830	.7738	3.318
19	.9503	18	433.051	7.214	31.240	.3335	1.444
20	.9548	18	435.101	4.426	19.257	.6800	2.958
21	.9498	18	432.596	3.677	15.906	.3565	1.542
22	.9481	18	432.049	4.798	20.739	.5475	2.365
23	.9525	19	434.054	4.865	21.116	.5460	2.368
24	.9525	19	434.054	5.017	21.776	.5589	2.425
25	.9565	19	435.877	5.613	24.465	.5585	2.434
26	.9572	19	436.196	6.136	26.765	.7847	3.422
27	.9555	18	435.421	4.343	18.910	.5427	2.363
28	.9547	18	435.056	4.591	19.978	.5762	2.506
29	.9471	18	431.598	4.764	20.561	.5186	2.119
30	.9696	18	447.770	4.987	22.319	.8582	3.842
31	.9496	18	432.782	4.769	20.637	.4749	2.055
32	.9483	18	432.140	5.178	24.997	.6963	3.017
33	.9765	18	444.991	Broken	Broken	Broken	Broken
34	.9514	18	433.542	4.894	19.095	.5925	2.668
35	.9258	18	421.887	3.192	13.456	.2590	1.092
36	.9450	18	430.636	4.089	17.604	.5463	2.352
37	.9526	18	434.098	4.897	21.257	.6715	2.914
38	.9533	18	434.398	4.133	17.953	.1660	.7211
39	.9525	18	434.054	4.599	19.962	.8227	3.575
40	.9474	18	431.780	5.104	22.035	.6961	3.005

THE EXTENT TO WHICH ALCOHOL AFFECTS THE DIGESTIVE POWER OF PEPSIN.

BY O. H. SOETJE.

The following experiments were performed to ascertain the exact extent to which alcohol affects the digestive power of pepsin on standing, the percentage strength of the alcohol being the same as found in the Wines, Elixirs, and Essences of Pepsin.

The two extracts given below show the results of the experiments of E. Scheffer and M. Bardet on the incompatibility of alcohol with pepsin.

"In my former articles written about pepsin, I have mentioned the incompatibility of pepsin and alcohol, and have spoken of the impropriety of dispensing pepsin in the form of wine or elixir. Having now a purer pepsin at my disposal than before, I repeated the experiments with entirely the same results.

"Seven vials of solution of pepsin, each containing the same amount of pepsin and hydrochloric acid, were made, with that difference, that, while vial No. I contained only one fluid ounce of water, No. II contained one half drachm of alcohol and seven and one half drachms of water; No. III one drachm of alcohol and seven drachms of water: and so each following vial one half drachm of alcohol more than the preceding one, so that in vial No. VII there were five drachms of water and three drachms of alcohol. The same amount of coagulated albumen was given into each vial, which were then exposed to a temperature of 100° F. After six hours in vial No. I all the albumen was dissolved; in No. II some albumen was left undissolved; No. III contained more, and in No. IV over half of the albumen was not dissolved; while in V, VI, and VII, the albumen was a little changed in appearance, but the bulk not diminished. The contents of those vials in which the albumen was not much acted upon, emitted that peculiar sour odor which characterizes discharges of an overloaded stomach (with beer or wine) by vomiting.

"A solution of half a grain of purified pepsin in half a fluid ounce of water with three drops of hydrochloric acid, was mixed with one fluid ounce of sherry wine, after 24 hours filtered, and then, with the addition of 150 grains of coagulated albumen, exposed to a temperature of 105° F. After six hours — during which time the half grain of purified pepsin in acidulated water solution would have dissolved 250 grains of coagulated albumen — of the 150 grains at least ⅓ yet remained. I added now six drops more of hydrochloric acid to bring the liquid to my standard acidity, but even at the end of 24 hours a large quantity of the albumen was undissolved." — *A. J. Ph.* XLIV, 59.

"It is generally accepted as having been demonstrated in laboratory experiments that an alcoholic liquid is not a suitable vehicle for the administration of pepsin on account of the property of alcohol to render latent the activity of the ferment, although it has been contended, on the other hand, that the rapid absorption of alcohol by the stomach diminishes the importance of this property. . . . M. Bardet found that by treating 10 grammes of fresh pepsin with 75 grammes of distilled water, the residue that remained undissolved amounted to 4 per cent. Upon pouring in an equal quantity of alcohol, the precipitate raised the quantity to 20 per cent, but when the pepsin was treated directly with a warm mixture of equal quantities of alcohol and water, the undissolved matter fell below 10 per cent, and became comparable with the result obtained with distilled water only. If this proportion of alcohol were exceeded, the insolubility increased rapidly. With respect to the permanent effect of alcohol on pepsin, it was found that in an alcoholic liquor containing not more than 20 per cent of alcohol, pepsin might remain indefinitely with impunity; but with larger proportions of alcohol, from 25 to 70 per cent, the permanent loss of activity was rigorously proportional until at the latter strength the ferment was killed. The inference drawn is that elixirs and similar preparations of pepsin should never be made of higher alcoholic strength than 20 per cent. It must also be remembered that these results were obtained with mixtures of alcohol and water, and probably would not hold good for a wine containing tannin."—*Pharm. Jour. and Trans.* XVIII, 93.

Out of the many tests used for the assay of the digestive power of pepsin, that of the *National Formulary* and that of Dr. Eccles were selected. The *National Formulary* test is quite well known, but Dr. Eccles' being rather recent, is not so well known and will be given here.

Dr. Eccles' Test: "Fifty cubic centimetres of raw egg albumen are added to one hundred and fifty cubic centimetres of water, shaken violently a short time, strained through linen or cotton, and amount wanted for a test put into a flask If forty cubic centimetres are used, we will have ten cubic centimetres of albumen. The flask and contents are now raised to the boiling point and kept there for about ten minutes. When examined it will be found to be a mass of coagulated albumen as finely divided as is oil in a very fine emulsion, and held as evenly as if in solution. . . . The total amount must next be raised to fifty cubic centimetres by the addition of dilute muriatic acid, water, and pepsin, enough to make it of 0.2 per cent strength of the acid and such proportion of pepsin as may be desired. The flask is placed on a bath at 40° C. and allowed to remain till entirely digested. By several trials the amount of albumen that will dissolve can be ascertained. A few drops of strong nitric acid added to a little of the solution in a test-tube, will tell whether digestion is complete or not.

"But it has been noted that a comparatively longer time is required to bring about a complete clearing up after a mere cloudiness is left, than to dissolve a goodly quantity of albumen before. To save time the plan was devised of leaving the final traces unchanged and having a standard comparison tube prepared to fix the end of the work. This can be done by taking some of the albumen solution and diluting it with water down to one fourth of one per cent. Placing say four cubic centimetres of this in a test-tube and boiling, or better still adding strong nitric acid and coagulating, we get a standard opalescence that must be reached by a given amount of pepsin in a given amount of albumen solution and by a given time."

The criticisms on the *National Formulary* Test are numerous, Dr. Eccles' Test also being criticised. The principal differences are the condition of the albumen, the state the pepsin is in, and the length of time digested. Dr. Eccles' Test seems to have many advantages over the *National Formulary* and most other tests. Shaking is done away with and no attention is required, only when the test is completed, beyond the regulating of the temperature. The albumen is much more reliable and no washing or weighing of a precipitate is required.

Two varieties of pepsin were used and a preparation of wine, elixir, and essence made from each on the following dates; the wine May 9th, the elixir May 11th, and the essence May 6th. The per cent strength of alcohol in the wine was 23, in the elixir 18¾, and in the essence 10. Each of these preparations was allowed to stand three weeks, being tested each week by both tests mentioned and were found not to suffer. A sample of the wine, which had been prepared for one year, was assayed and found to have lost one fourth of its stated digestive power. Another sample three years old had lost $\frac{9}{10}$ of its power, being nearly inert. A preparation of elixir one year old, had lost ⅛ of its digestive power. A sample of essence one year old, was unchanged or nearly so, no difference being noticeable. The preparations which had stood a year or more were not assayed when made but were made of the very same pepsin and by the same formula containing the same alcoholic strength. The elixir and wine contained a precipitate, but the essence did not. The pepsins used in all these tests were the best procurable, the assay of them showing three times the strength of the *National Formulary* standard. The *National Formulary* Test does not reject pepsin unless its digestive power is less than 1 to 500.

CONSTITUTION AND BY-LAWS.

ADOPTED AT PETOSKEY, MICHIGAN, JULY 13TH, 1887.

PREAMBLE.

WHEREAS, Organization, concert of action, and comparison of ideas are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore,—

Resolved, That we, druggists of the State of Michigan, whose names are hereunto attached, in compliance with an act entitled, An Act to Organize the Reputable Pharmacists of the State of Michigan, into an Association to be known as the Michigan Pharmaceutical Association, approved April, 1887, do hereby organize ourselves into such Association, and adopt the following Constitution and By-laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The object of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard, and, ultimately, to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.— MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.— OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next *meeting*, a Treasurer, and an Executive Committee of five members, all of whom shall be elected by ballot at the third sitting of the regular annual meeting of the Association, and to serve until their successors are elected.

ARTICLE V.— DUTIES OF OFFICERS.

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, until the close of such meetings; call special meetings at the written request of twenty-five members; fill all vacancies that may occur in the offices of the Association between the annual meetings; shall present at each meeting a report of the Association, and perform such other duties as pertain to the office.

SEC. 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all monies for dues, and from all other sources, giving receipts

for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee. He shall file a copy of the proceedings of each annual meeting in the office of the State Board of Health, and the Secretary of State, and shall keep at least three copies in his own office.

SEC. 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

SEC. 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without necessary delay, all papers and property of the Association committed to their care.

SEC. 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI. — MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII. — BY-LAWS.

This Association may establish for its future government and regulation, such By-laws, not in conflict with the Constitution, as may be deemed proper and desirable.

ARTICLE VIII. — AMENDMENTS.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.— QUORUM.

Twelve members shall constitute a quorum.

ARTICLE II.— MEMBERSHIP.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented in writing, signed by two members in good standing, to the Executive Committee, and if favorably acted upon by that committee, the candidate shall be considered elected. A vote of all the members of the Executive Committee shall be required for an election.

ARTICLE III.— FEES.

The initiation fee of this Association shall be one dollar, which fee shall accompany the application.

ARTICLE IV.— DUES.

[As Amended Aug. 4, 1892, at Grand Rapids Meeting.]

Every member shall pay to the Secretary on or before the first day of January of each year the sum of one dollar. Any member in arrears shall not be entitled to vote. It shall be the duty of the secretary to draw on all members when two years in arrears, previously sending notice of his intention to draw at a certain date. Any person neglecting to pay dues for three successive years shall forfeit membership. Dues paid by new members before an annual meet-

ing shall apply on the present year. Those becoming members and paying dues after an annual meeting shall receive credit for the following year.

ARTICLE V.—CERTIFICATE OF MEMBERSHIP.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI. — COMMITTEES.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be an ex-officio member), each to consist of three members, viz.: Committee on Trade Interests; Committee on Pharmacy and Queries; Committee on Legislation; Committee on Adulterations.

SEC. 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.

SEC. 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions of investigation as may be practicable, to be reported upon at the next annual meeting.

SEC. 4. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII. — SUSPENSIONS — AMENDMENTS.

SECTION 1. These By-laws shall not be suspended without the consent of two-thirds of the members present.

SEC. 2. Any amendment to these By-laws must be made in writing and read before the Association at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these By-laws.

ARTICLE VIII.— DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meeting of the American Pharmaceutical Association.

ARTICLE IX.— PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees, and members, shall be published annually under the supervision of an editor, who shall be elected annually, and who shall be paid from the funds of the Association, and a copy of the proceedings shall be sent to each member of the Association less than two years in arrears.

ARTICLE X.— EXPULSION OF MEMBERS.

Any member or officer accused of violating the Constitution or By-laws, or other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting In every case definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the charges, and notify him in writing, at least two weeks in advance, of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense.

ARTICLE XI.—EXHIBITS.

The Association invites manufacturers and others to exhibit at the annual meetings, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.—RULES OF ORDER—ORDER OF BUSINESS.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SEC. 2. The order of business shall be such as the Executive Committee shall prescribe.

THE PHARMACY LAW.

AN ACT

To regulate the practice of pharmacy in the State of Michigan.

(ACT No. 134, LAWS OF 1885.)

SECTION 1. *The People of the State of Michigan enact*, That the Governor, with the advice and consent of the Senate, shall, within thirty days after the passage of this act, appoint five persons and annually thereafter one person from among such competent pharmacists in the State as have had ten years' practical experience in dispensing physicians' prescriptions, who shall constitute the Michigan Board of Pharmacy. The term of office of said five persons shall be so arranged that the term of one shall expire on the thirty-first day of December of each year, and all appointments made thereafter shall be for the term of five years.

SEC. 2. The said board shall, within thirty days after its appointment, meet, and organize by election of a president and secretary, from its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the board. It shall be the duty of the board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to investigate complaints and to cause the prosecution of all persons violating its provisions; to report annually to the Governor, and to the Michigan Pharmaceutical Association upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said board for the year, and also the names of all pharmacists duly registered under this act; the board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties, at least once in four months, said meetings to be held on the first Tuesdays of March, July, and November in each year; shall make By-laws for the proper fulfillment of its duties under this act, and shall keep a book of registration in which shall be entered the names and places of business of all persons registered under this Act, which book shall also specify such facts as said persons shall claim to justify their registration. The records of said board, or a copy of any part thereof, certified by the Secretary to be a true copy, attested by the seal of the board, shall be accepted as competent evidence in all courts of the State. Three members of said board shall constitute a quorum.

SEC. 3. The Secretary of the board and the Treasurer thereof, if such separate office be created, shall receive a salary which shall be fixed by the board; they shall also receive the amount of their traveling and other expenses incurred in the performance of their official duties. The other members shall receive the sum of three dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in the performance of their official duties. Said salaries, per diem, and expenses, shall be paid from the fees received under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be paid into the State treasury at the end of each year, and so much thereof as shall be necessary

to meet the current expenses of said board, shall be subject to the order thereof, if, in any year, the receipts of said board shall not be equal to its expenses The board shall make an annual report and render an account to the Board of State Auditors, and to the Michigan Pharmaceutical Association, of all moneys received and disbursed by it pursuant to this act.

SEC. 4. Every person who shall, within three months after this act takes effect, forward the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State at the time this act takes effect, in the preparation of physicians' prescriptions, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed ~~in this State~~, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist; *Provided*, That in case of failure or neglect to register as herein provided, then such person shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy hereinafter described.

SEC. 5. No person other than a licentiate in pharmacy shall be entitled to registration as a pharmacist, except as provided in Section Four. Licentiates in pharmacy shall be such persons, not less than eighteen years of age, who shall have passed a satisfactory examination touching their competency before the Board of Pharmacy. Every such person shall, before an examination is granted, furnish satisfactory evidence that he is of temperate habits, and pay to the board a fee of three dollars: *Provided*, That in case of a failure of any applicant to pass a satisfactory examination, the money shall be held to his credit for a second examination at any time within one year. The said board may grant certificates of registration without further examination to the licentiates of such other boards of pharmacy as it may deem proper upon a payment of a fee of two dollars.

SEC. 6. The said board may grant, under such rules and regulations as it may deem proper, at a fee not exceeding one dollar, the certificate of registered assistant to clerks or assistants in pharmacy not less than eighteen years of age, who at the time this act takes effect shall be engaged in such service in this State, and have been employed or engaged two years or more in the practice of pharmacy, but such certificate shall not entitle the holder to engage in such business on his own account, or to take charge of or act as manager of a pharmacy or drug store.

SEC. 7. Each registered pharmacist, or registered assistant, who desires to continue the practice of his profession shall annually, after the expiration of the first year of his registration, during the time he shall continue in such practice, on such date as the board of pharmacy may determine, pay to the said board a registration fee to be fixed by the board, but which shall not exceed one dollar for a pharmacist, or fifty cents for an assistant, for which he shall receive a renewal of said registration. Every person receiving a certificate under this act shall keep the same conspicuously exposed in his place of business. Every registered pharmacist, or assistant, shall, within ten days after changing his place of business or employment, as designated by his certificate, notify the secretary of the board of his new place of business. If any pharmacist or registered assistant shall fail or neglect to procure his annual registration, or to comply with the other provisions of this section, his right to act as such pharmacist or assistant shall cease at the expiration of ten days from the time notice of such failure to comply with the provisions of this section shall have been mailed to him by the secretary of said board.

SEC. 8. All or any registration obtained through false representations shall be void, and the board of pharmacy may hear complaints and evidence, and may revoke such certificates as it may deem improperly held.

SEC. 9. Any proprietor of a pharmacy who, not being a registered pharmacist, shall, ninety days after this act takes effect, fail or neglect to place in charge of such pharmacy a registered pharmacist, or any such proprietor who shall by himself, or any other person, permit the compounding or dispensing of prescriptions, or the vending of drugs, medicines, or poisons, in his store or place

of business, except by or in the presence and under the supervision of a registered pharmacist, or except by a registered assistant; or any person not being a registered pharmacist who shall take charge of or act as manager of such pharmacy or store, or who, not being a registered pharmacist or registered assistant, shall retail, compound, or dispense drugs, medicines, or poisons, or any person violating any other provision of this act to which no other penalty is herein attached, shall be deemed guilty of a misdemeanor, and for every such offense, upon conviction thereof, shall be punished by a fine of not less than ten nor more than one hundred dollars, and in default of payment thereof, shall be imprisoned not less than ten days nor more than ninety days, or both, such fine and imprisonment in the discretion of the court.

SEC. 10. Nothing in this act shall apply to, or in any manner interfere with, the business of any practicing physician who does not keep open shop for retailing, dispensing, or compounding of medicine and poison, or prevent him from supplying to his patient such articles as may seem to him proper, nor with the vending of patent or proprietary medicines by any retail dealer *who has been in such business three years or more*, nor with the selling by any person of drugs, medicines, chemicals, essential oils, and tinctures, which are put up in bottles, boxes, packages, bearing labels securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons three months, six months, one year, three years, five years, ten years, fifteen years, and twenty-one years of age, and if a poison, the name or names of the most common antidotes: of copperas, borax, blue vitriol, saltpetre, pepper, sulphur, brimstone, paris green, liquorice, sage, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerine, Glauber salts, epsom salts, cream tartar, bi-carbonate of soda, sugar of lead, and such acids as are used in coloring and tanning, nor with the selling of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, laudanum, quinine, and all other preparations of cinchona bark, tincture of aconite, and tincture of iron, compound cathartic pills, or quinine pills, nor with the exclusively wholesale business of any dealer: *Provided*, that every person who shall within three months after this act takes effect forward to the board of pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State, in the preparation of physicians' prescriptions, three years next previous to the second day of June, 1885, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist. *And provided further*, That the said board may grant, at a fee not exceeding one dollar, to such person not less than sixteen years of age who shall pass a satisfactory examination touching his competency before the Board of Pharmacy, the certificate of registered "assistant," but such certificate shall not entitle the holder to engage in business on his own account or to take charge of or act as manager of a pharmacy or drug store.

SEC. 11. No person shall add to or remove from any drug, medicine, chemical, pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value, or medicinal effect, or which shall alter the nature or composition of such drug, medicine, chemical, or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or purity. Any person who shall thus willfully adulterate or alter, or cause to be adulterated or altered, or shall sell or offer for sale, any such drugs, medicine, chemical, or pharmaceutical preparation, or any person who shall substitute, or cause to be substituted, one material for another, with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. If convicted, he shall be liable to all the costs of the action, and for the first offense be liable to a fine of not less than ten dollars nor more than one hundred dollars, and for each subsequent offense a fine of not less than twenty-five dollars nor

more than one hundred and fifty dollars. On complaint being entered, the Board of Pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulteration, substitution, or alteration, and report upon the result of his investigation; and if said report shall be deemed to justify such action, the board shall duly cause the prosecution of the offender, as provided in this act.

SEC. 12. The senior pharmacist of every house dispensing and compounding medicines, registered under this act, shall be exempt and free from all jury duty in the courts of this State.

SEC. 13. All acts and parts of acts in conflict with the provisions of this act are hereby repealed.

Approved June 2, 1885.

NOTE.—Section 10 in this Act is the Amended section, entitled an "Act to Amend Sec. 10," etc. Approved June 18, 1887.

ROLL OF MEMBERS.

M. S. P. A.

Adams, H. M., Port Huron 1888
Aisenman, Wolf A., Oklahoma City, O. T. 1891
Akey, J. V., 114 S. Spring St., Los Angeles, Cal. 1885
Aldworth, F. G., Grand Rapids 1884
Allen, A. W., 410 Grand River Ave., Detroit 1888
Allen, Chalmers P., West Bay City ... 1891
Allen, Earl, Grand Rapids 1887
Allen, Harris Edson, Morenci 1892
Alsdorf, F. M., Lansing 1888
Amberg, Isaac, Battle Creek 1886
Anderson, C. N., 95 Woodward Ave., Detroit 1888
Anderson, Edwin S., 159 Jefferson Ave., Detroit 1888
Anderson, Ellery, Midland 1884
Anderson, Moxson, Midland 1884
Andrus, E. J., Utica 1886
Armstrong, R. S., Chelsea 1888
Arthur, Hiram, Dowagiac 1887
Atchinson, F. E., Gladwin 1888
Babbington, John, Corunna 1884
Bachman, M. H., Stanton 1883
Bailey, Dr. John R., Mackinac Island. 1890
Bailey, M. G., Mackinac Island 1888
Baker, H. G., Johnson, Nelson & Co., Detroit 1888
Ballard, Edwin, Saginaw, W. S. ... 1890
Bangs, W. Z., Grand Rapids 1885
Banister, George E., Utica 1889
Bannister, John L., 201 S. Washington St., Saginaw, E. S 1890
Barber, M. A., Petoskey 1887
Barle, H. L., 535 Macomb St., Detroit. 1887
Barnard, Wm. Dwight, Manistee 1891
Barrows, J. F., Lawrence 1885
Bassett, A., 95 Woodward Ave., Detroit. 1884
Bassett, J. A., Ypsilanti 1885
Bauer, A. C., Detroit 1884
Beach, L. F., Bay City 1884
Beacham, C. B., Romeo 1884
Beckwith, R. G., Bradley 1888
Beebe, G.C., 100 Harrison St., Bay City. 1890
Beeden, Bert N., Williams, Davis, Brooks & Co., Detroit 1889
Bell, Jno., Lexington 1888
Belsher, W. E., East Saginaw 1884
Bennett, C. W., Quincy 1888
Berridge, Chas. S., Orion, Oakland Co. 1890
Bertram, J. P., Westphalia 1883
Bigelow, W. H., Owosso 1884
Blackmer, H. A., Charlotte 1884
Blair, C. A., Morenci 1885
Blakeslee, L. G., Detroit 1885
Blatchley, C. H., Manistee 1888
Bliss, Lyman W., Saginaw 1890
Boden, Edwin T., West Bay City 1890
Boehnlein, Geo., Williams, Davis, Brooks & Co., Detroit 1886
Bogart, Frank A., Detroit 1890
Borradaile, 41 Michigan Ave., Detroit. 1892
Bostick, Chas. H., Manton 1892
Bostick, J. C., Manton 1887
Botsford, E. S., Dorr 1886
Bower, J. E., Crystal Falls 1887
Bower, Reuben T., Jr., Petoskey 1891
Boynton, Oliver C., Port Huron 1890
Brackett, F. E., Cheboygan 1887
Braden, Cyrus F., Lakeview 1890
Breitenbach, A. P., 99 Elizabeth St., Detroit 1889
Bricker, C. E., Port Huron 1888
Briggs, J. W., Schoolcraft 1888
Bristol, F. E., Lapeer 1884
Bristol, N. D., Lapeer 1884
Brooks, Alanson S., Detroit 1890
Bross, C. M., Jerome 1889
Brown, D. D., Kalamazoo 1885
Brown, H. J., Ann Arbor 1888
Brown, J. J., Okemos 1883
Brown, W. J., Marquette 1888
Brundage, F., Muskegon 1886
Bruske, R., East Saginaw 1885
Buchanan, B. F., Harrisville 1883
Buchanan, B. S., Detroit 1888
Buckham, B. J., Flint 1890
Bugbee, C. A., Cheboygan 1885
Burdick, H. H., West Bay City 1884
Burley, David H., 111 Huron Ave., Port Huron 1890
Burroughs, C. S., Clinton 1884
Burwell, R. G., Fort Gratiot 1884
Cady, G. F., Hart 1883
Caldwell, J. W., 242 Grand River Ave., Detroit 1888
Calkins, E. E., Ann Arbor 1884
Calkins, S. B., Charlevoix 1885
Campbell, J. E., 477 Grand River Ave., Detroit 1888
Carney, M. S., Decatur 1885
Caulkins, F. D., Bay City 1888
Chamberlin, G. T., Hartford 1883
Champney, W. R., 27 Lafayette Ave., Detroit 1883
Chandler, C. A., Cumbria 1884
Church, H. M., Holly 1884
Church, Wm. D., Parke, Davis & Co., Detroit 1889
Clark, A. B., Gobleville 1889
Clark, A. G., White Cloud 1883
Clark, H. C., Detroit 1888
Clark, J. K., Blissfield 1884
Clark, S. B., Flint 1890
Claxton, W. C., Calgary Alberta, N. W. T., Can 1885
Coe, T. D., Romeo 1884
Cohoe, Adolph, Capac 1890
Coleman, G. E., Elk Rapids 1885
Collins, A. B., Charlotte 1889
Collins, Jno. B., Frankfort 1888
Colman, H. G., Kalamazoo 1884
Colwell, Dr. C. B., Jackson 1886
Conrad, J. F., Otsego 1886
Conway, V. R., Sault Ste. Marie 1885
Cook, C. E., 912 Van Buren St., Bay City 1884
Cooper, I. S., Cheboygan 1885
Cornell, Aaron, Elkton 1890
Cornell, David A., Copemish 1892
Cosford, J. W., Mancelona 1887
Craft, C. V., Flint 1890
Crawford, J. B., Detroit 1885
Cress, Edward A., Minden City 1890
Crispe, John, Plainwell 1886
Croman, Jas. M., 291 Woodward Ave., Detroit 1889
Crouter, G. W., Charlevoix 1883
Crowley, J. J., 421 Michigan Ave., Detroit 1884
Culver, Dr. R. W., South Haven 1886
Cummer, R. J., 1116 Payne Ave., Cleveland, Ohio 1884
Cunningham, A. R., 264 Jos. Campau Ave., Detroit 1891
Curran, E. S., St. Joseph 1883

Currie, A. A., St. Clair 1885
Curtis, C. A., Petoskey 1885
Curtis, F. E., Napoleon 1885
Curtis, W. H., Saginaw 1890
Cushman, H. D., Three Rivers 1884
Cutler, W. R., Ionia 1883
Damon, J. A., Millington 1884
Darling, G. S., Tawas City 1888
Davis, F. C., Sand Beach 1888
Davis, George S., Detroit 1888
Davis, Jas. E., Detroit 1884
Davis, T. W., 308 Woodward Ave., Detroit 1888
Dayton, A. J., 674 Wealthy Ave., Grand Rapids 1887
Dean, H. M., Niles 1887
DeForest, George G., 874 Woodward Ave., Detroit 1890
Dendel, W. H., Hopkins Station 1892
Dennis, G. C., Rochester 1888
DePuy, C. E., Stockbridge 1888
Dewey, C. C., Napoleon 1885
Dewitt, P. A., Spring Lake 1888
Dillon, Jas. E., East Tawas 1887
Dodd, I. LeRoy H., Buchanan 1884
Dolsen, Henry, 200 North Hamilton St., Saginaw 1890
Dorman, Charles, Elkton 1890
Dorr, F. W., Manchester 1888
Dorrance, A. A., Coldwater 1883
Dullam, Frank, Flint 1890
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Dumond, G. W., Tuscola 1890
Dunbar, R. H., Parma 1885
Dunlap, Thomas, South Lyon 1884
Dunlop, J. W., Clare 1888
Dupont, William, 182 Michigan Ave., Detroit 1883
Eberbach, O., Ann Arbor 1883
Eberbach, Wm. F., Ann Arbor 1889
Eckerman, A., Muskegon 1884
Eldred, B. C., Chesaning 1885
Elfbrandt, Henry, Negaunee 1890
Elliot, R. H., Pontiac 1885
Empey, M. C., South Bay City 1884
Erwin, M. J., Harbor Springs 1887
Fairchild, H. B., Grand Rapids 1886
Farrand, J. S., Jr., Detroit 1888
Fanckboner, Orin A., 429 East Bridge St., Grand Rapids 1890
Fay, O. J., Carlton 1888
Fellows, C. A., Three Rivers 1884
Fenton, A. W., Bailey 1886
Fenton, George L., Kingsley 1885
Fildew, A. S., St. Johns 1884
Fincher, F. W., Pentwater 1883
Fisher, James, Marlette 1887
Fisk, C. A. E., Petoskey 1885
Foot, Wm. H., East Saginaw 1884
Foote, C. E., Jackson 1886
Fordham, M., Elmira 1885
Fordham, W. W., Elmira 1884
Forsyth, Edward L., Kalamazoo 1891
Foster, Albert, Benton Harbor 1890
Fox, J. R., Cedar Springs 1886
French, C. S., Hillsdale 1888
Frenzel, G. S., Mayville 1889
Fritz, T. H., Cass City 1885
Fuller, Fred R., Newberry 1890
Fuqua, C. B., Big Rapids 1891
Furniss, John C., Nashville 1891
Gallagher, Edward W., 2701 Washington Ave., Saginaw, E. S. 1890
Gardner, A. R., Fowlerville 1884
Garner, EdwardJ., Canby, Emmet Co 1891
Garrigues, E. B., 410 Race St., Philadelphia 1889
Gates, Dr. T. O., East Tawas 1884
Gerow, J. E., Ovid 1883
Gidday, Fred'k. K., Farrand, Williams & Clark, Detroit 1892
Gill, W. J., Beacon 1884
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Gladwin, H. L., Merrill 1886
Glazier, F. P., Chelsea 1885
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Goodrich, L. A., Hillsdale 1884
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Gould, Otis, Henderson 1888
Gover, G. H., Leaton 1884
Grandy, Francis, Fairfield 1885
Greenthal, Julius, 986 Michigan Ave., Detroit 1888
Griffith, W. F., Ionia 1883
Groseman, Wm., 1218 Court St., Saginaw, W. S. 1890
Grunow, O. H., 182 Gratiot Ave., Detroit 1884
Gundrum, George, Ionia 1883
Hackett, P. E., Wolverine 1886
Haeussler, G. J., Manchester 1885
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Hall, George C., 118 West Congress St., Detroit 1886
Hall, W. A., Greenville 1884
Hamilton, E. A., White Pigeon 1883
Hamilton, Jerome D., M.D., PawPaw. 1882
Hamlen, R.J., 813 Gratiot Ave., Detroit. 1885
Harper, J. C., Milan 1884
Harrison, H. E., Richmond 1884
Hart, Austin P., Mulliken 1891
Harvey, S. K., Detroit 1884
Harwood, G. M., Petoskey 1884
Harwood, Henry, Ishpeming 1885
Hawkins, A. H., Clayton 1888
Haynes, D. O., 835 Jefferson Ave., Detroit 1886
Heath, Fred, Hastings 1884
Heimbach, S. J., Constantine 1884
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Hicks, C. F., Pontiac 1891
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Hicks, W. H., Morley 1888
Hinchman, C. C., 76 Jefferson Ave., Detroit 1885
Hinchman, J. M., 76 Jefferson Ave., Detroit 1888
Hinchman, Theo.H., 76 Jefferson Ave., Detroit 1888
Hinds, E. J., Midland 1886
Hisner, H. C., Jefferson Ave., and Third St., Detroit 1888
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Holton, Samuel M., Battle Creek 1890
Hopkins, F. S., Benton Harbor 1886
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LaRue, C. M., West Bay City 1885
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Law, Dr. W. J., Leroy 1889
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Leland, N. P., 430 West King St., Owosso 1886
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McGee, Thomas H., 417 Court St., Saginaw, W. S 1891
McKenna, J. D., Shepherd 1884
McKibbin, R. S., 322 Fort St., W. Detroit 1888
McMullen, G. H., Ionia 1883
McMurtie, Fred. J., Three Rivers 1889
MacKimmie, G. D., 29 Jefferson Ave., Detroit 1888
Malmgren, Gustav A., Iron Mountain. 1887
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Mann, Albert, Ann Arbor 1883
Mann, Chas. F., 845 3rd Ave., Detroit 1888
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Parker, A. S., 747 Woodward Ave., Detroit 1888
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Passage, J. H., Greenville 1886
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Patterson, B. M., 238 Randolph St., Detroit 1885
Pauly, L., St. Ignace 1887
Peck, A. W., Petoskey 1883
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Peckham, H. C., Freeport 1885

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Perham, Jason, Kent City 1888
Perry, D. B., West Bay City 1883
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Phillips, H. S., Carson City 1888
Phillips, W. R., Battle Creek 1883
Pierson, L. R., Des Moines, Ia 1888
Pike, N., Morley 1888
Piper, Fred H., 717 Ionia St., Lansing 1889
Platts, Randolph, Port Sanilac 1884
Potter, Frank P., Allegan 1892
Powell, A. H., Gladstone 1890
Power, J. O., Addison 1884
Prall, D. E., East Saginaw 1883
Pratt, G. O., 723 Antoine St., Detroit. 1884
Pratt, Stephen, Howell 1885
Prescott, A. B., Ann Arbor 1883
Price, Geo. A., Spring Lake 1892
Purvis, G. S., 983 Jefferson Ave., Detroit 1885
Raider, J. F. A., Newaygo 1883
Raizon, Jas., Wakefield 1888
Randolph, A. M., Northville 1883
Ray, G. C., West Bay City 1885
Raymo, Owen, Wayne 1888
Raynale, Frank B., Detroit 1891
Reidy, Mike, Corunna 1884
Remus, Wm., Pontiac 1892
Revell, Samuel, Roscommon 1888
Reynolds, Linton E., 508 Michigan Ave., Lansing 1890
Reynolds, W. B., Charlotte 1883
Rice, C. E., Lenox 1888
Rich, John W., Manistee 1885
Richards, F. P., 204 Jos. Campau Ave., Detroit 1885
Richards, T. H., 780 Jefferson Ave., Detroit 1884
Richmond, T. W., Bear Lake 1888
Riggs, Miles E., Cheboygan 1891
Ringler, Eugene, Saginaw 1884
Ripley, L. G., Montague 1884
Roberts, D. O., Kalamazoo 1887
Robertson, B. J., Breedsville 1884
Robinson, E. H., 2399 St. Catherine St., Montreal 1888
Rodenbaugh, H. W., Breedsville 1887
Rodenbaugh, J. N., Mancelona 1886
Rodenbaugh, O. L., Mancelona 1885
Rodgers, E. J., Port Huron 1884
Roeser, Otto W., Saginaw, W. S. 1890
Rogers, A., Ravenna 1888
Rogers, Arthur S., Vassar 1889
Ross, E. W., 147 Congress St. W., Detroit 1884
Rothacher, Jacob W., 720 Gratiot Ave., Detroit 1892
Roussin, V., Ludington 1884
Rudolphi, A. E., Dowagiac 1886
Rundel, J., Holton 1886
Runner, J. W., Shelby 1886
Russell, Dorian M., 166 W. Bridge St., Grand Rapids 1892
Russell, Elsworth E., Jackson 1890
Sackett, S. M., Monroe 1883
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Sanford, Frank A., Grand Rapids 1889
Sawyer, R. J., Menominee 1883
Sayers, J. A., Seney 1885
Schaefer, Wm., Carleton 1885
Schlotterbeck, Julius O., Ann Arbor. 1890
Schmidt, Walter Karl, 84 Canal St., Grand Rapids 1892
Schott, A. A., East Saginaw 1888
Schrouder, Benj., 209 E. Bridge St., Grand Rapids 1892
Schultz, L. S., St. Joseph 1885
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Simoneau, Leander, Saginaw, E. S. 1890
Simoneau, Richard T., Saginaw, E.S. 1890
Simpson, Floyd D., Flint 1891
Slawson, W. W., Greenville 1886
Sloan, E. E., Clarkston 1885
Smallidge, F. E., 701 Jefferson Ave., Detroit 1889
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Smith, Dr. Harvey W., Carsonville... 1890
Smith, Samuel R., 217 Watson St., Grand Rapids 1892
Smythe, Wm. J., Meyer Bros. Drug Co., St. Louis, Mo 1890
Snow, H. W., Omaha, Neb 1885
Snyder, Dr. Walter C., Horton, Jackson Co 1890
Soule, C. A., 171 Griswold St., Detroit. 1884
Spalsbury, Duane, Three Rivers 1890
Spayde, W. H., Bloomingdale 1886
Speckhard, Adolphus O., Watersmeet 1891
Spencer, J. L., Linden 1883
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Swift, George, 101 Griswold St., Detroit 1883
Taylor, Mrs. C. W., Loomis 1885
Taylor, H. S., 54 Selden Ave., Detroit 1889
Temple, F. J., Ridgeway 1891
Tepoorten, Frank A., Bay City 1890
Terrill, Dr. B. E., Muir 1886
Thayer, A. R., 747 Emerson St., Saginaw, E. S 1890
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Thum, Hugo, Grand Rapids..... 1884
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Trombly, C. K., 594 Gratiot Ave., Detroit..... 1888
Tubbs, C. C., Chesaning..... 1883
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Turner, Dr. R., Flat Rock..... 1886
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VanBochove, R., 445 Lyon St., Grand Rapids..... 1886
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VanEmster, F. H. J., Bay City..... 1885
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VanLiew, Volney C., Vestaburg..... 1889
VanMarter, Ezra J., 428 East Main St., Jackson..... 1884
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VanSickle, Clarence E., St. Johns..... 1892
VanSlype, N. F. L., 255 St. Aubin Ave., Detroit..... 1888
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Wagner, C. H., Big Rapids..... 1888
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Waldorf, A., 411 Woodward Ave., Detroit..... 1888
Walker, A. L., 411 Woodward Ave., Detroit..... 1888
Walker, J. David, East Saginaw..... 1891
Walker, W. K., Lansing..... 1883
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Waples, Grafton, 930 Michigan Ave., Detroit..... 1884
Ward, G. J., St. Clair..... 1884
Warne, F. C., East Jordan..... 1886
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Warner, W. A., with T. H. Hinchman & Sons, Detroit..... 1884
Warren, W. M., 210 E. Congress St., Detroit..... 1888
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Watson, J. B., Coopersville..... 1884
Watson, R. A., 764 Fort St., W. Detroit..... 1888
Watz, H. G., Saginaw..... 1884
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Webber, A. H., Cadillac..... 1884
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Weise, H. L., 592 McDougal Ave., Detroit..... 1884
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Wells, C. A., Yale..... 1886
Wetzel, H. A., 902 Jefferson Ave., Detroit..... 1888
Whipple, G. N., 222 Orleans St., Detroit..... 1885
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Zahn, Jonathan A., 291 Woodward Ave., Detroit..... 1890
Zimmer, Wm. A., Manistee..... 1888

HONORARY MEMBERS.

Duffield, S. P., Ph. D., M. D.	Detroit.	Elected 1887.
Englehard, G. P.	Chicago, Ill.	" 1888.
Lyons, Albert B.	Honolulu, Hawaii	" 1891.
Stowell, Mrs. L. R., M. D.	Washington, D. C.	" 1887.
Vaughan, V. C., Ph. D., M. D.	Ann Arbor.	" 1887.
Wrumpelmeier, T. J., Ph. C.	San Diego, Cal	" 1887.
Wells, Frank	Lansing.	" 1890.

RESIGNED.

De Boe, Jno., Hinds, E. J., Mandigo, W. R.

REINSTATED.

Hessler, Will, Hopkins, I. F., Kenyon, W. W.,
Williams, J. P., Witherspoon, G. A.

DROPPED.

Albright, John H.,	Cornell, E. A.,	Merriam, Chas. H.,
Blatchley, C. H.,	Goodsill, A. A.,	Mc Millen, W. R.,
Croman, Jas. M.,	Hotchkiss, F.,	Sherling, F. W.

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Bartram, E. W., Paw Paw. Kirkwood, C. H., Ishpeming.

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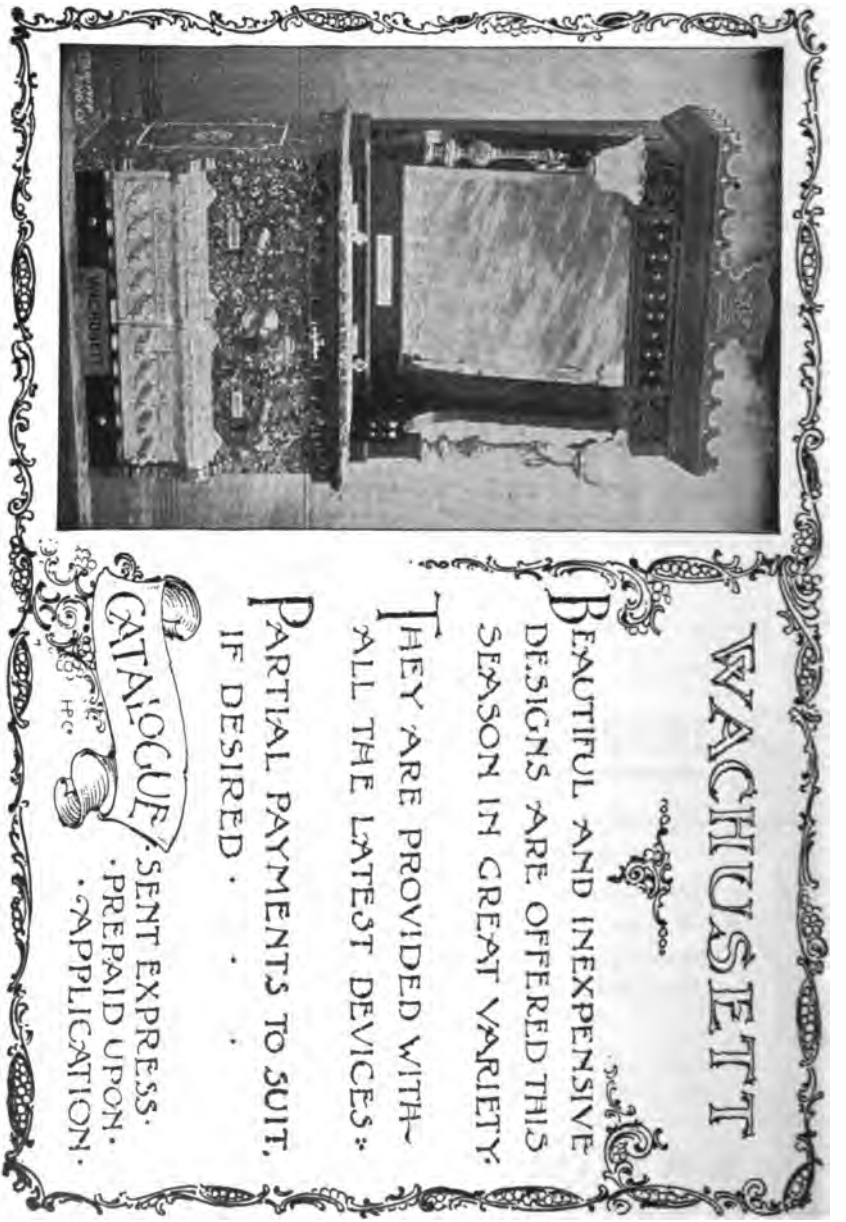
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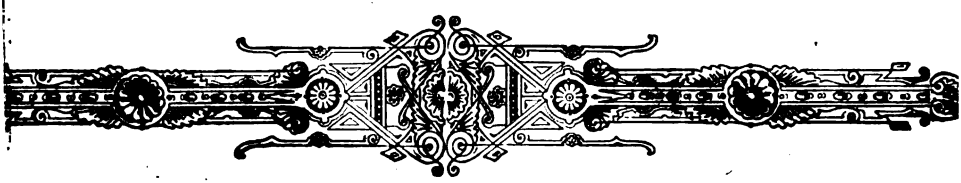
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MEETING HELD AT

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FIRST SESSION.

THE Association was called to order at 8 o'clock P. M., June 19, by the President, Mr. S. E. Parkill.

President: It gives me great pleasure and no little degree of satisfaction to be able to greet so many of the pharmacists of the State as we have with us this evening. The past year has been a quiet one for us. There has been nothing particular agitating the mind of the druggist. So far as legislation is concerned, we have safely run the guantlet of another legislature. We have experienced no legislative difficulties. There were several bills entered, but they never got farther than to be reported to the various committees. I trust that the reports of the various committees will furnish food for discussion at this meeting. I think that the Secretary has some applications to present.

Secretary: Mr. President, the roll has been swelled by some twenty or more new members, but the names of some of these members are in the hands of the Executive Committee, and as there is present no member of that committee, we will have to postpone the reading of the names of these new members until farther along in the meeting. I would state that, during the past year, different from the previous year, very little correspondence has been carried on. Mr. James E. Davis, president of the National Wholesale Druggists Association, appointed as delegates to this meeting, Messrs. Hinchman and Williamson. Neither of the gentlemen is present; but as more members are expected to-morrow, it is possible that either or both of these gentlemen will appear. I have received a communication from Messrs. Seabury and Johnson offering a prize for the best essay on certain topics. There is no report as yet. I have also received a communication from the A. P. A. Committee on International Pharmaceutical Congress.

CHICAGO, June 16, 1893.

To the Secretary of the Michigan Pharmaceutical Association, Detroit, Mich.

DEAR SIR: I desire to call your special attention to the invitation lately issued to all pharmaceutical bodies entitled to representation in the International Pharmaceutical Congress, to select three delegates to that Congress, and to the request to inform me of the names and addresses of said delegates as soon as possible, and not later than the first of August.

Will you be kind enough to see to it that your organization takes formal action at the earliest day practicable, and that three delegates and three alternates be selected and their names and addresses reported to me, in order that the Committee on Arrangements may be able to act intelligently in matters intrusted to its charge preliminary to the opening of the Congress.

Very respectfully yours,
OSCAR OLDBERG,
Chairman.

I am also in receipt of the following letter, which has had the Secretary's attention: —

DETROIT, MICH., March 23, 1893.

To the Members of the Michigan Pharmaceutial Association.

GENTLEMEN: The annual gathering of your Association at a short distance from our city, is a most pleasant reminder of your previous meetings in Detroit, and of the visits to our Laboratory, with which you have honored us in the past. We accordingly take the greatest pleasure in extending to you, through your local Secretary, our cordial invitation to visit us in a body, or individually; to inspect our various departments, and to receive such little entertainment as we may be enabled to offer you, ere you leave our buildings. We sincerely trust that no hesitation will be felt by any member of your Association in accepting the foregoing, and we shall be happy to see you with us in full force, on Thursday, June 22, suiting your own convenience as to the hour of your visit.

With fraternal greetings, we remain,
Faithfully yours,
PARKE, DAVIS & CO.

I have here a letter of importance, a communication from the United States Department of Agriculture. For some time, beginning perhaps a year ago, there has been considerable attention called to an article called "black pepsin," offered to farmers, and claimed to make more butter from milk than the cows see fit to put into it. The Department of Agriculture has sent circular letters throughout the country, and in connection with black pepsin, writes this to your Secretary: —

U. S. DEPT. OF AGRICULTURE, DIV. OF CHEM.,
WASHINGTON, D. C., March 20, 1893.

DEAR SIR: Please furnish me with any information that you may have in relation to the use of pepsin or black pepsin (so-called) in butter-making. I should be glad to learn also anything in relation to any other butter and cheese adulterants, and to obtain any reliable data concerning the adulteration of children's foods, dairy and pharmaceutical preparations. I inclose franked envelope for reply.

Please furnish me the names and addresses which you may know, of any State or municipal officials charged with executing the laws relating to the adulteration of foods and drugs, also the names of officers or members of the Pharmaceutical Associations and Dairy Organizations in your State, and oblige,

Yours truly,
H. W. WILEY,
Chemist.

Approved:
EDWIN WILLITS,
Assistant Secretary.

U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C., May 8, 1898.

Chas. W. Parsons, Esq.

DEAR SIR: Please accept thanks for copy of Pharmacy Laws, etc. I shall take pleasure in mailing you our reports when printed, or any other matter you may desire from our division. I would like to get your ideas as to how the department can best advance the interest of the pharmacist in prosecuting the investigation of food and drug adulterations. I take it that no class of people are more interested in the subject than the honest dispenser of drugs, having as he does to a great extent, the lives of the people in his hands.

Yours truly,

ALEX. J. WEDDESBAUM,
Special Agent.

I wrote in reply all the information which I could obtain regarding black pepsin. The Department of Agriculture has made analyses and prepared a report on the subject. I have received one or two letters covering special legislative measures last winter, but it was found unnecessary to take special action regarding them. I would say that we have, in preparation by the various committees, some unusually good reports. That on Trade Interests will be heard to-morrow, and it is one which ought to excite considerable discussion. As much, or more, can be said regarding the report of the Committee on Adulterations. It is expected that a number of committees will make their reports to-morrow.

Mr. Vernor: Messrs. Williamson and Lightner of Detroit, have kindly contributed a number of bottles of perfume, sachet powder, and cucumber jelly, to be offered as prizes for various contests which are to take place during this meeting. Mr. Williamson sent a good supply of the cucumber jelly. He said he thought it would be particularly appropriate for this party. I have also received a letter from the Michigan Yacht Club, signed by Vice-Commodore John A. Heames, inviting us to visit their beautiful club house. I would say, in connection, that the Park and Boulevard Commissioners have given us permission to take their park wagons for a drive around the island. It is the first time they have ever been allowed off the island. They will come to Parke, Davis & Co's laboratory for the party. We will go up as far as the Michigan Yacht Club and then take a drive around the island, finally taking the ferry to the foot of Woodward Avenue. Arrangements have been made with the Star-Cole Line of Steamers, by which you can have your baggage checked to Detroit, where it will remain in the warehouse until claimed, thus avoiding the trouble of carrying it around with you during the visit to Parke, Davis & Co., and the drive around the island.

Secretary: I would like to say, in addition to what has already been said with regard to what we have in store for us, that we have with us a new element; viz., a number of the graduating class in pharmacy from Ann Arbor. They come by invitation to fraternize with us, and I need not say how welcome they are. We are promised some very interesting papers by them. The Alumni Association will hold its meeting to-

morrow noon. We expect a very considerable number to come up to-morrow on the morning boat, and also some on the afternoon boat, and I think it will be well to delay the greater portion of our business until later in the sessions, after the arrival of this contingent.

Vernor: Mr. Chairman, I wish to move that the Alumni and all other persons interested, be entitled to the privileges of this Association, in the discussions of this meeting.

President: You have heard the motion that the Alumni and all other persons interested, be allowed the privileges of the Association, so far as the present meeting is concerned. All in favor please signify by saying "Ay;" contrary, "No." The motion is carried.

President: The Secretary will now read his report.

Secretary: Mr. President, I would say that the Secretary would like to defer the reading of his report until later in the meeting. It has always been customary to make reports only up to the time of the first session of the Annual Association, but we want this report to include the expenses of the present meeting, and to show the balance at the conclusion of the present one. We want to start a new year with our debts paid. Heretofore, as soon as the annual meeting was over, numerous bills came in which could not appear in the report until the next meeting, and the members of the Executive Committee thought it would be a good idea to make a new arrangement. I would, therefore, prefer to defer my report until later. It would be necessary for me to see the Treasurer, too, before handing in my report.

President: Last year our Secretary's report showed a balance of $489.64, but immediately after the meeting, there were vouchers drawn for bills to be paid, which exhausted the amount. There were many dues to be collected and circulars were sent to these gentlemen, stating that we were in need of the money. Many could not understand how it was that the Secretary's report showed a balance on hand and still we needed dues, while really Mr. Parsons was obliged to advance money out of his own pocket.

Secretary: Mr. Sherrard, who will read the report of the Committee on Adulterations, is a new member, and I would like to introduce him to you as the chairman of the Committee on Adulterations.

REPORT OF COMMITTEE ON ADULTERATIONS.

The few notes herewith presented are mostly compiled from observations made in the laboratory, upon drugs and preparations which passed through our hands.

We believe there is a growing tendency, on the part of manufacturers of pharmaceutical goods in particular, to furnish products of genuine and uniform strength. The idea should not prevail that pharmaceutical and chemical manufacturers are prone to furnish articles under strength, much less adulterations; for, as a rule, and there are very few exceptions, the standards are properly adjusted, and each product is made to conform to that standard. In the case of fluid extracts, each cubic centimeter represents the active medicinal constituents

of one gram of the drug; so with all other classes of our pharmaceutical list, a standard is fixed and a constant effort made to conform to that standard.

The greatest obstacle with the retail trade is in cases where special brands are introduced, varying as a class, or in certain particulars, from the requirements directed by the pharmacopœia. Some of these, like a certain fluid extract of aconite and jalap, mentioned later on, will bear close scrutinizing. Occasional apparent differences in the same preparation put up by different houses are observed, because of different menstrua being used, while at the same time each fluid possesses all of the active medicinal constituents and consequent therapeutic properties of the drug. It is with fixed and essential oils, paints, confections, etc., and occasionally crude drugs and a few special pharmaceutical goods that most of our adulterations are to be found. It is not a bad plan to give manufacturers and wholesale dealers credit for being honest in this matter until the reverse has been proven. Instances of false charges have a number of times been observed, among which is the prevalent belief that slippery elm bark, white pine bark, and rhubarb have been adulterated with starches. This occasionally occurs, but not often.

Slippery Elm Bark.— A sample of slippery elm bark said to be adulterated with starch was referred to a member of this committee, and upon careful examination was found to be a powder of good quality, containing no more starch than is naturally present in the drug. The starch present in this bark occurs in small grains, and may be easily distinguished under the microscope from other starches with which it is sometimes adulterated.

White Pine Bark *(Pinus Strobus, Linne)*.— In the case of white pine bark, the reports were evidently erroneous, as this bark contains a starch peculiar to itself, which resides for the most part in the outer bark, and is mixed with considerable resinous matter. The close resemblance of the starch granule in this bark to that of wheat starch, has undoubtedly led to the conclusion that the powdered bark is frequently adulterated.

Rhubarb.— A single instance, also, of a sample of powdered rhubarb was referred to the same member of the committee, and as in the two preceding cases, it was found to contain no foreign ingredients or added starches. A similar case of caffeine citrate, said to be impure, was shown to be pure. These facts prompt the observation that no attention should be paid to such statements unless they emanate from reliable sources. Jumping at conclusions in technical and scientific work is certainly bad policy.

Caffeine Citrate.— Samples of this salt, sold at about one third to one half the usual price, have been examined and found to contain large excesses of citric acid, and in one instance as high as 74% of the acid against 53.9% in the normal salt.

Caffeine Hydrobromate.— A sample sold for the above salt, upon analysis was found to consist of caffeine alkaloid, a large amount of sodium acetate, a little potassium (perhaps an impurity), but no bromide.

Ammonia.— One sample of stronger water of ammonia contained considerable iron, imparting considerable color to the solution.

Calcined Magnesia.— A large number of samples of this drug have been examined, a few instances occurring where it contained variable amounts of carbonate, and in one instance very appreciable amounts of calcium sulphate.

Baking Powders.— There being no recognized standard for the composition of baking powders, it is not an easy matter to decide what shall constitute an adulterant. Perhaps the only way would be to prove its deleterious effects upon health, a difficult thing to do. Too little attention has been paid to this subject. Cream of tartar baking powders are placed upon the market with various fillers. Bulletin 13, Division of Chemistry, U. S. Department of Agriculture, on Baking Powders, contains a complete and valuable report upon this subject. Among other things, the chief of the department states that, if a substance is sold as a cream of tartar which is either not cream of tartar, or is sophisticated with some cheaper substance, the seller could be convicted under food adulteration laws; but if the cream of tartar were incorporated into a mixture with other chemicals, and the whole sold as baking powder, no conviction could be secured. The trea-

tise referred to is too exhaustive to attempt any review here, but is well worth procuring or studying.

Cod Liver Oil.— A case of adulteration, wherein vaseline oil (liquid paraffin) was found to the extent of 95 %.

Arnica Flowers.— Within the last year, attention has been called to the fact that arnica flowers have been largely adulterated with spurious flowers, called Italian arnicas, but in reality no arnicas at all.

Artificial Coffee Beans.— A company engaged in the manufacture of this article, it is claimed, is located in Philadelphia, Pa.; also another manufacturer of the same sophistication, in Sioux City, Iowa. Experts readily detect the difference in the spurious and genuine coffee bean; although the former is a close imitation of the true bean, it is much heavier. It is said that the bean is made of rye-flour and chicory.

Inferior Castoreum.— W. Fossek describes some castoreum entering commerce from Russia, which, by its appearance and putrid odor, excites attention. It does not appear to be an artificial product, but represents an abnormal, physiological, natural product. An examination revealed 21% ash, against 2% from good castoreum. This high percentage of ash is due to the presence of numerous globular concrements having a radiating structure, and which are probably an organic calcium combination. The alcoholic extract amounted to only one half that obtained from true castoreum.

Caramel.— Inferior grades of caramel due to imperfect burning are becoming more frequent. A good grade should dissolve in a menstruum containing 55 to 63% of alcohol, without subsequent gelatinization or separation.

Phosphon.— Mr. Allen, a Detroit chemist, reports phosphon, a proprietary baking powder, to consist of ammonia-alum-sulphate, and calcium sulphate.

Laudanum.— Several samples of various makes of this preparation of opium have been assayed, the morphine varying from 0.7 to 1%

Glycerin.— A great many samples of glycerin have been examined and found fully up to the standard, with two exceptions, where small amounts of cane sugar, iron, and chlorids were obtained.

Oil of Geranium in Rose Oil.— Perhaps the most common sophistication practiced with oil of rose is with the above named oil; oil of rhodium is also sometimes substituted.

The following tests *(Bulletin de la Société Chim.)* show the presence of oil of geranium in oil of rose: Decolorize fuchsine with sulphurous acid and add to 2 c.c. of this solution two or three drops of the oil. If the rose oil is pure, it will gradually (in about one day) assume a red color, but if it contains oil of geranium, it will be colored blue in about two hours. Also, concentrated solution produces with oil of geranium a brown mass, which is not entirely dissolved by stronger alcohol; the solution in this instance is colored red, and the undissolved particles are yellow. On the other hand, oil of rose yields a mass completely soluble in alcohol and remains colorless.

Oil of Sandalwood.— Frequent complaints within the last year have been made regarding this oil. E. Mesnard ascertained *(Jour. de Phar. et de Chim.*, Aug. 15, 1892) that pure oil of sandalwood, on being mixed with sulphuric acid, yields a viscid liquid, which becomes pasty and rapidly solidifies, the mass being of a light grayish-blue color, and adhering firmly to the glass. If, however, adulterated with oil of cedar, copaiba, cubeb, or turpentine, the resinous mass produced does not completely solidify, and retains always a dark tint of a very distinct shade. The so-called German oil of sandalwood is said to contain about equal quantities of East India oil, and oil of cedar.

Test for Rosin in Damar.— Hirschsohn *(Pharm. Zeit. Russ.)* gives the following process: 20 c.c. of ammonia (sp. gr. 0.96) are poured over two grams of the powdered mixture under examination. The solution is allowed to stand for fifteen minutes or half an hour, after which it is passed through a double filter, and the filtrate (displaying more or less of opalescence) is supersaturated with acetic acid. This will result in the separation of a few flakes only, if the damar contains 5% of rosin; if 10% is present, the precipitate will be abun-

dant, while with 20% the compound cannot be filtered, since it stiffens into a jelly.

ADULTERATION OF IODOFORM GAUZE.— Attention has been called (*Bull. Commer.*) to the sophistication of iodoform gauze. The gauze examined was marked 30%, but analysis showed it to contain only 8%; the deficiency in color was made up by a nitro-derivative of phenol. This adulterant is looked for by first treating the gauze with water, when, if it be present, a yellow-colored solution results, yielding on evaporation a golden-yellow residue, which after being fused over charcoal, will not color ether and has lost its bitter taste. Properly prepared iodoform gauze yields no coloring matter to water.

PEANUT OIL IN OLIVE OIL.— This is not a frequent but only an occasional fraud. Holde, after careful trial of the various forms for detecting the above adulteration, gives the preference to Renard's which he describes as follows: —

Ten grains of the suspected oil, after being saponified and the fatty acids separated by hydrochloric acid, are dissolved in 90% alcohol and precipitated by sugar of lead. The oleate of lead is separated by ether; and the residuum, consisting of palmitic and arachic acids, is decomposed by hydrochloric acid. The fatty acids are dissolved with the aid of 50 c.c. or 90% alcohol. The arachic acid which separates after cooling, is filtered out and washed first with 90% alcohol, and afterward with 70% alcohol. It is then dissolved in hot alcohol and the solution evaporated in a weighed capsule. The weight of the residue, after taking into account the acid dissolved in the alcohol, equals the whole amount of arachic acid contained in the oil. The melting point of the residuum should be 70° to 71° C. With this process the author has always been successful; but when the olive oil contains not more than 5 to 10% of peanut oil, it is necessary to make the test with not less than 40 grains of the former, otherwise the melting point of the arachic acid cannot be estimated. Furthermore, acids which are separated from the lead salt by hydrochloric acid must be recrystallized repeatedly with 90% alcohol until the melting point ceases to rise, in case the latter is not found to exceed 70° C. at the first estimation. When peanut oil is present the melting point will always be above 70° C.

The same sophistication is practiced with oil of bitter almonds. In addition to peanut oil, artificial oil of bitter almond (benzaldehyde, not oil of mirbane) is largely used. It is a very enticing adulterant since the artificial oil is worth less than one fifth the price of the true oil, free from Prussic acid. The benzaldehydes placed upon the market as chlorine-free are not found upon close examination (Schimmel's Semi-annual Report) to merit this distinction or designation. On application of the well-known silver nitrate test, the chlorine can be quite unmistakably demonstrated, not only in the product itself, but also in mixtures of the same with genuine natural oil.

Prof. J. O. Schlotterbeck has very kindly handed the committee the following notes:—

1. POTASSIUM IODIDE (P. & W.) was obtained from a drug store in the city (Ann Arbor). A prescription calling for potassium iodide and syrup ferrous iodide was compounded, with the production of a green, flocculent precipitate of ferrous hydrate and ferrous carbonate; a drop of muriatic acid restored the mixture to its proper color and caused some effervescence. He tested the sample for alkali and iodate and found more than the pharmacopœia admits. It is his intention to offer a thesis, subjects upon this line of work, and also upon incompatibilities of potassium iodide when contaminated with free alkali.

2. A sample of lead chromate procured from a German chemist and labeled C. P., he found to consist of calcium carbonate, barium sulphate, and calcium sulphate, traces of lead, and some undetermined aniline dye.

3. A sample of linseed oil sent him by a Romeo druggist and stated to be pure, contained 19 to 20 % of mineral oil. All tests, such as Hubl's Kottstorfer's actual separation, temperature reactions with sulphuric acid, pointed to the adulteration by mineral oil.

4. A Southern flour, of which Mr. Schlotterbeck will give particulars, was sold for pure wheat flour, but contained approximately 20 to 25 % of white cornmeal.

A few notes handed over from the committee of last year are the following:—

LINSEED OIL.— Adulterated with Java oil, oxylite, Brazilian railway oil, linoline, corn oil, kalon oil, and some fish oils. Fish oil, with equal parts of bromine water, vigorously shaken, forms a pure white emulsion. With the true linseed oil a separation occurs giving a marked lemon color to the upper layer. With 25 % of fish oil in pure, raw linseed oil, a yellow emulsion is produced, which does not separate readily. The test may be applied to other oils, including rosin oil, and noting differences of results.

INSECT POWDERS.— F. A. Thompson reports these to be adulterated with foreign flowers, and colored with lead chromate, and cautions against the use of highly colored powders.

REDUCED IRON.— W. J. Smythe reported samples not answering the U. S. Pharmacopœia requirements

PARIS GREEN is said to be sometimes composed of commercial powdered arsenic and plaster. Likewise, dextrine is sometimes a fraudulent admixture with powdered acacia.

The grades of BALSAM COPAIBA are quite variable. Dodge & Olcott warn purchasers against the presence of rosin oil. An excess of oil interferes with the solidification of copaiba with magnesia.

ARTIFICIAL OIL OF WINTERGREEN may be detected in oil of wintergreen by the bromine test. Equal parts of bromine water and the oil are shaken vigorously for at least five minutes, and then allowed to stand twelve to twenty-four hours. The true oil will form a lemon-colored emulsion separating in two layers, and gradually changing to a deep orange color. The synthetical oil remains colorless and often not emulsifying. In the A. P. A. Proceedings for 1892, Mr. Benj. H. Ewing gives a volumetric process for oil of wintergreen which is quite valuable.

OIL OF SESAMUM (Benne oil) is a frequent adulteration of oil of sweet almond.

OIL OF SASSAFRAS.— We take the following note from Askinson's "Perfumes and their Preparation," page 47 : "Since the principal constituent of oil of sassafras ; viz., safrol, has been found to be contained in the crude oil of Japanese camphor, the latter has to a very large extent taken the place of the natural oil."

OIL OF WORMWOOD.— We saw one sample of oil of wormwood, Michigan, which was adulterated with oil of camphor.

MALE FERN.— Varieties of unpeeled male fern almost destitute of oleoresin, have been put upon the trade. This inferiority can be easily detected by simply estimating the amount of oleoresin in the drug. Male fern should yield from 6 to 10% of oleoresin. Two samples assayed, yielded respectively 8.5 and 8.8 %. Samples of the unpeeled, mostly obtained from the South, yielded 1.6, 1.5, and 1.7 %, respectively.

WINE.— Sherry wine obtained from various sources varied in percentage of alcohol by weight from 9 to 14¼ %. Port wine varied from 12 to 18%.

CUBEB BERRIES.— Of the numerous samples of cubebs assayed, all, with one exception, were of fairly good quality, the lowest yield of oleoresin was 11.6%, the highest 27.6%, with an average of 21.34%, excluding the 11.6% sample.

FLUID EXTRACTS OF ACONITE AND JALAP.— Samples of these two fluid extracts were received, with the statement that they had been deprived of all precipitable matter, but still retained the full amount of alkaloid and resin respectively. The first part of the statement was for the most part true. The

fluid extract of aconite was almost free from extractive, but contained 85% of alkaloid by titration with Mayer's reagent. The query arose whether this may not have been fortified with aconitine. In the case of the fluid extract of jalap, the yield of resin was only 2.46%.

BEEF EXTRACTS.— A number of brands of beef extracts have been examined, some of which contain large amounts of sodium chlorid, and in one case considerable potassium nitrate, 22% in all, of the two salts. In about one half the cases, large amounts of aniline colors were used by the manufacturers to produce the desired colors.

PANCREATIN.— Most of the leading brands of pancreatin have been assayed, with very satisfactory results, on starches, milk, and egg albumen.

ALKALOIDAL AND RESINOUS DRUGS.— Careful inspection of the trade regarding this class of drugs gives little or no reason for criticisms.

SALICYLIC ACID.— Attention should be called to the fact that artificial salicylic acid often contains an impurity which exerts an irritating effect upon the stomach and sometimes produces alarming symptoms. The impurity is a phenol derivative and may be separated from salicylic acid by the difference of their solubilities; it is a buff-colored powder, and possesses poisonous properties. It may be eliminated by carefully subliming the commercial product.

ORRIS ROOT.— Powdered orris root sometimes contains mixtures of verona. This impurity may be detected and estimated fairly well by making up tinctures of equal strengths from the genuine articles and mixing the two in different proportions until a similarity is obtained.

CUMARIN.— Acetanilide has been considerably used as a sophistication of this product.

VANILLIN.— This has been adulterated with benzoic acid.

OIL OF LEMON of inferior quality is made from refuse lemons with considerable admixtures of rectified turpentine.

OIL OF CITRONELLA may contain large amounts of oil of camphor and oil of vaseline.

OIL OF CEDAR has been upon the market which contained an equal amount of spirit of turpentine.

OIL OF CARAWAY SEED is now too often adulterated with oil of caraway chaff, which can be distinguished by procuring guaranteed samples of each, mixing in different proportions, and keeping samples of the mixtures for comparison. Much caraway oil, which has been partially decarburized, is sold to non-experts.

The above suggestions for detecting poor grades and admixtures are quite applicable in most cases of adulterations of oils.

ANGELICA.— A sample of Archangelica obtained from a druggist in California was of a very dark oily appearance, the oil exuding from the drug. The price charged for the drug was exorbitant because of extra (?) quality. The article had evidently been tampered with by soaking it in some fixed oil. No effort was made to determine the kind of oil used. Archangelica contains only about one half of one per cent of a volatile oil.

Our leading pharmaceutical journals are constantly on the alert for any impositions which may be attempted upon the pharmacist, and few efforts of this perverse nature escape their notice and due consideration at their hands. In running over recent issues of the *Pharmaceutical Era*, I find a large number of interesting and important observations upon adulterations, a few of which are the following: —

TAN TINT.— Prepared chalk is produced by using red oxide of iron as a coloring material or adulterant.

CONFECTIONS.— This class of preparations deserves constant inspection because of harmful ingredients frequently entering into them, such as admixtures

of terra alba, kaolin, or other substances, calculated to give weight, volume, and color to the mass.

HEMPSEED OIL IN LINSEED OIL.— The difference in price prevents adulteration of the latter with the former, still some hempseed oil finds its way into linseed oil, because of a custom in some places of mixing the two seeds. Hempseed oil does not boil in the same way as linseed oil. Its specific gravity is .925 to .931 compared with .936 for linseed oil. The iodine number of hempseed is 143, and of linseed 158.

SESAME OIL IN OLIVE OIL.— This sophistication, which frequently occurs, may be detected by adding gradually a ten-per-cent solution of bisulphite of soda; the red color produced by olive oil disappears very quickly, whereas that produced by sesame will remain ten to forty minutes.

TURMERIC.— The only adulteration to which turmeric is liable in commerce is common salt, which is sometimes added in quantity to the roots while going through the mill. This sophistication, besides adding to the weight, gives it a brighter appearance in the powder, at the risk of very seriously interfering with its use in the dye house. The detection of the fraud is easy. A small portion of the suspected powder is boiled in a test-tube, with pure concentrated nitric acid, till the organic matter is destroyed. The remaining liquid is then diluted with pure water, and a solution of nitrate of silver added. If salt has been present, a copious white curdy precipitate will be formed. The characteristics of a good turmeric are a rich, deep, but bright orange color, and a strong aromatic, rather pungent odor. It should be perfectly dry. If damp, it loses its brightness, turns a dull brown, and dyes only flat colors.

SOAP ADULTERATION.—The German soap-makers have called the attention of the Prussian Minister of Industry and Commerce to the growing frequency with which adulterated soaps are now advertised. The most common adulterants are said to be starch, flour, tallow, spar, common salt, mineral lubricating oil, and water.

ANISE SEED.— A sample of anise seed examined was found to consist of 2½ % seeds of *Conium maculatum*, 55 % fennel seed, and 10½ % seed of grass (*Panicum*).

METHYL-BLUE AND METHYLENE-BLUE.— The former is the sodium salt of pararosaniline sulphuric acid; it is also known as M. B. I. for cotton. It is a dark blue powder, soluble in water, forming a dark blue solution. Methylene-blue, B. B. B., is a salt of tetramethylamine. The salt most commonly met with is the double chloride of zinc and tetramethylamine. They are both used medicinally and internally, and one is sometimes substituted for the other. In view of this fact, physicians who use the zinc salt should know whether they are administering the right product.

GUAYACOL.— Creosote has been substituted for this product. The specific gravity of creosote is about 1.075, and of guayacol 1.117; the latter is worth about seven times as much as the former.

ALMOND OIL.— The true oil pressed from almonds is sometimes adulterated with an oil pressed from peach kernels. The smallest adulteration with peach or other lower grade oils may be detected by mixing one part each of sulphuric acid, nitric acid, and distilled water, and shaking this mixture with one part of the oil. The pure oil will give a whitish or yellowish paste, while the impure oil gives a reddish paste.

EUCALYPTOL is sometimes adulterated with alcohol. This imposition may be detected by adding a little spirit of turpentine, which produces a cloudiness with eucalyptol and alcohol, even if the latter be present in very small proportion.

VERMILION, when pure, is not attacked by acids or alkalies; only aqua regia, a mixture of hydrochloric and nitric acids, is capable of dissolving it, when it forms a clear solution. When heated in the flame of a Bunsen burner, it is completely volatile, a property possessed by no other pigment in common use; therefore, any adulteration can be readily detected by simply heating a little vermilion in a crucible; if a known weight is taken and the residue is weighed, the amount of adulteration can be determined. Vermilion is chiefly

adulterated with oxide of iron, orange lead, and vermilionette. From the character of the residue left on heating in a crucible, the kind of adulteration can be readily ascertained.

SULPHUROUS ACID IN WINE.— Old choice wines, it is claimed, contain large amounts of sulphurous acid, much in excess of what is held to be admissible.

VINEGAR.— Mineral acids are frequently employed to increase the acidity of vinegar, and may be detected by adding a few drops of a solution of methyl-violet to a small quantity of the vinegar poured upon a white plate. The presence of nitric acid produces a blue coloration, and with hydrochloric or sulphuric acid a green color is seen. These colors are exactly reversed when rosaniline-blue is used instead of methyl-violet.

MICROSCOPICAL TEST FOR BEESWAX.— Make a solution of the suspected wax in chloroform, and let a drop of it fall on a slide. As soon as a pellicle begins to form, let a coverglass fall on it, but do not press down, at least not heavily. Put in a cool place and let stand. In the course of from twenty to thirty minutes you may examine it, using a one-fifth objective and two-inch eye piece; and if the wax is free from mineral fats, or from fatty acids, you will observe tufts of feathery crystals form in such manner that each group assumes the shape of dumb bells, or double balls of crystals, radiating from a common center in each ball. These balls vary from 25 to 50 microns ($\frac{1}{1250}$ to $\frac{1}{625}$ inch) in diameter, according to the rapidity of evaporation of the solvent. The crystals are the same for yellow or white wax, and in pure wax, no other shapes are seen. If animal, vegetable, or mineral fats are present, the wax crystals will be seen intermingled with the characteristic crystals of the adulterating fats. The observation can be made without the use of the polariscope, but the latter renders the detection of foreign fats much easier.

SYRUP OF HYPOPHOSPHITES.— In making the syrup of hypophosphites (U. S. P.) and also the compound syrup of the N. F., considerable sediment occurs, insoluble in water and larger in amount than the U. S. P. would seem to have intended to be dissolved by citric acid. The officinal tests were therefore applied with the following results. All of the salts examined were obtained from leading manufacturers through jobbers, and are usually on sale by retailers.

Four samples of hypophosphite of calcium gave the following results. A solution of 10 grms, in 100 c.c. of distilled water was made in each case: —

	No. 1.	No. 2.	No. 3.	No. 4.
Residue of insoluble salts of calcium, filtered out, dried, and weighed.	0.34 grms. = 3.4 per cent.	0.20 grms. = 2 per cent.	0.25 grms. = 2.5 per cent.	0.13 grms. = 1.3 per cent.
With test solution of acetate of lead (soluble phosphate), the precipitate dried and weighed.	0.44 grms.	trace.	0,5 grms.	0
Acidulated with HNO_3 and bulk added (soluble sulphate), precipitate dried and weighed.	trace.	0.20 grms.	0.20 grms.	0.18 grms.
Total impurities	5.6 per cent.	3 per cent.	6 per cent.	2.5 per cent

Two samples of sodium hypophosphite were taken, and 10 grms. dissolved completely in 100 c.c. of distilled water.

	No. 1.	No. 2.
With test solution of Ammonium oxalate (calcium), precipitate, dried and weighted.	0.09 grms.	0.10 grms.
With HCl.	Slight effervescence.	No effervescence.
With HCl and BaCl (Sulphate.)	trace.	0.33 grms.
Total impurities	.09 per cent.	3 per cent.

Sample of potassium hypophosphite 10 grms. dissolved in 100 c.c. distilled water with some sediment, gave a considerable precipitate for Ca. with ammonium oxalate and a heavy precipitate of sulphate with barium chlorid.

Two samples of iron hypophosphite were very sparingly soluble in acetic acid either of 6%, 36%, or 80%, showing the presence of a large amount of phosphate, but both were completely soluble in citrate of sodium.

That future reports may be more practical and more to the point, and, if possible, more comprehensive, the committee, in conclusion, would make a few suggestions and recommendations :—

We think the usefulness and practical utility of this committee may be very materially increased by confining its work more particularly to drugs and pharmaceutical products with which the retail druggist has to deal. Technical chemistry, it is true, should receive due consideration. A committee of one or two active members cannot hope to accomplish as much as the Association expects, owing to the fact that most men are so engaged that their time is too limited for exhaustive or extensive work on many subjects. In most cases one, or at most, a very few, drugs is all that can be studied or examined for sophistications or impurities, because trustworthy and satisfactory results can only be obtained by a considerable amount of research, both as regards literature and the procuring of specimens from diverse sources.

This not only requires a great amount of time and patience but more or less expense; the latter, however, would be a minor obstacle compared with the former. In view of these facts, we deem it advisable to make a different adjustment, if possible, of the work.

As formerly, the committee should consist of three members, but with a number of assistants, say not less than ten — perhaps fifteen or twenty would be preferable. It should then be a part of the duty of the committee to assign, within at most two months from the time of appointment, each assistant certain work to be reported back to the committee not less than two months prior to the next annual meeting. Each of these assistants could be allowed to select his own subjects, or assignment made to him. This procedure we feel confident would result in more systematic and connected work in the analysis of drugs and preparations for the detection of adulterations and impurities, from year to year. One prolific source for obtaining good material, would probably be some of the physicians' supply houses which furnish preparations at cheap rates.

The privilege of assigning special work to these assistants, would no doubt result in securing more elaborate reports, from the fact that it is an official appointment. At the same time in addition to compiling or editing these reports from the members of the sub-committee, the main committee shall be expected to do equally as much or more work in the same line.

Another suggestion, less favorably considered, is the appointment of a person of recognized ability to do this work, who shall receive a stipulated amount of compensation. This individual could be appointed by the Association direct or by the committee of three. He might be allowed to select all of the subjects to be investigated, or a part of them, the remainder to be suggested or assigned by the committee.

Our own experience with this work has not alone prompted us to submit these suggestions, but considerable communication with members of former committees reveals the fact that they have labored under great disadvantages and restrictions, due to lack of time and to business obligations. It is true that an individual should not accept such a responsible position if he has any doubts about being able to fulfill the obligations devolving upon him. But there are few men who are qualified for so exacting a position, and who can devote the time to the work that is required to make a trustworthy and reliable report. Solicitation for help from individuals who are not officially appointed is, as a rule, much time and trouble thrown away. With two or three exceptions our large amount of communications and solicitations have been fruitless. This, we learn, has invariably been the experience of former committees.

For a number of reasons, the Committee on Adulterations is an important and invaluable committee of this Association; consequently appropriate interest should be taken by each member of the Association, and whenever a case of

inferiority, substitution, or adulteration has attracted attention, it should be noted and reported to the committee. This would aid very materially in furnishing a good report and one that would bear practical results and be more beneficial in a general way to the individual members.

In conclusion, we desire to say that most manufacturing houses put out galenicals and pharmaceuticals of standard qualities, but there are small manufacturers, starting up from time to time, offering improved specialties in one line or another; these the pharmacist should be able to judge by having means provided, if possible, for making his own examinations. In the case of resinous and alkaloidal drugs it would be a simple matter; and it is interest and work of this nature that must be resorted to, if we hope to raise our pharmaceutical products to ideal standards.

C. C. SHERRARD, *Chairman.*
O. C. JOHNSON,
D. H. HUNT.
} *Committee.*

During the reading of this report, it was moved by Mr. Vernor that a five minutes' recess be taken for lemonade. The motion was unanimously carried. The reading of the report was resumed in a short time. Applause at its conclusion.

President: I wish to say that in discussing these papers, there are not so many present but that every man can ask a question if he desires, and I trust that the discussions will be full after the reading of papers. I am sure Mr. Sherrard would be glad to answer any questions, and I would like to ask one or two myself. In regard to cod-liver oil, one sample shows 95% adulteration. Was that the only one you found adulterated?

Sherrard: Yes.

President: I would also like to ask you the names of the manufacturers of poor beef extract, but it might get them into trouble. I would, however, like to ask you the names of the manufacturers whose extracts you found to be all right.

Sherrard: Well, I might say for the most part, I find that the Omaha and Chicago companies put out a fair extract. The Nutritive Company also puts out good extracts, as well as pancreatins.

Stevens: Did you find on examination, an extract that an ordinary stomach would stand? I saw an extract tested in that way once. Two men made a quart of beef tea. Each drank a pint, and neither was able to attend the chemistry class that evening.

Prescott: I am glad that the report on this subject has been so satisfactory this year, and am glad that it will be published. There are some points which are particularly interesting and instructive. Take one of the first mentioned, the substitution of nitrophenol in iodoform gauze. That is a substitution of a cheap article for an expensive one. It is curious to see the different forms adulterations take. Adulterations are of such very unlike character that it is difficult to classify them. Potassium iodide is an instance in point. I suppose no samples of this can be said to be exactly adulterated, but if the manufacturer will allow a little alkali carbonate to go into it, its appearance is better. Why should we object to benzaldehyde? Why should we object to artificial oil of bitter almonds? I

have been told that their effects are alike, yet, in the hands of of different physicians, their effects have been different.

Schlotterbeck: I have made a pratical demonstration of the effect of impurities in potassium iodide. In prescription work the presence of free alkali or iodate is apt to cause annoying incompatibility, and precipitate the reducing principle. The experiments were interesting and striking.

Sherrard: Samples of a New York concern's tincture of jalap were sent in for examination, and they were found to run very high in alcohol. The preparation was particularly free from extractive, and had a low percentage of resin.

Stevens: Did you notice which resin?

Sherrard: No, I did not make note of that.

Eberbach: In regard to cod-liver oil containing vaseline oil, do you consider this an adulteration, or careless work in putting up the oil?

Sherrard: I cannot say. It might not have been intended.

Eberbach: What about the samples of male fern?

Sherrard: Nothing is known about the period of collection. Those who are dealing in the drug, as well as the Southern collectors, take no care in stating just what period is best for its collection. I made an examination of one sample of male fern, and found it to contain less than one per cent of resin.

Then followed a little discussion regarding the relative values of specimens of salicylic acid made from the natural oil of wintergreen and the artificial, and it was brought out that it cannot yet be definitely stated to just what causes are due the difference in therapeutic action which have been observed, though it is probable that, if the acid be made equally pure in each case, these differences would not be apparent.

Stevens: Regarding white wine, what quantity of alcohol is it supposed to contain?

Sherrard: White wines are supposed to contain from 20% to 25% of alcohol. Few of the samples which I examined came up to what was claimed for them. It might have been intentional.

President: Any more questions, gentlemen? One thing appears to me in connection with this report. Of course, it is of great value to us as it is, but it would be of much more value, if there were some stated provision by which punishment could be made to fall on the heads of each of those putting up these adulterated articles. I received some six or eight weeks ago, a communication from the president of another society, in which he requested me to bring to bear all the influence I could obtain through our Association, to secure the support of the Newkirk bill. I found that the only object of the bill was to provide that, as a punishment, an officer should go into a man's place of business, look over his stock and see if things were all right, and if they were not, the goods were to be confiscated. I never answered the letter. This is the only way I can see by which you are going to punish a man. This Asso-

ciation for the last ten years has been impressed with the importance of taking certain steps against adulterations, and I think that, if we can at any time, as individuals, encourage or help legislation that will look toward this end, it is our duty to do so. I would like to say that if there are any members of the graduating class in pharmacy, who are not already members of this Association, we should be glad to have you become members, and hope that you will introduce yourselves to the Secretary. Before closing we will listen to the

REPORT OF THE SECRETARY OF THE STATE BOARD OF PHARMACY.

Mr. S. E. Parkill, of Owosso, then submitted his report as Secretary of the State Board of Pharmacy, as follows:—

To the Michigan State Pharmaceutical Association.

I herewith submit the annual report of the Michigan Board of Pharmacy for the year ending July 6, 1893:—

RECEIPTS.

Cash on hand July 7, 1892	$1754 19
From 2927 renewals of registered pharmacists	2927 00
" 224 renewals of assistant pharmacists	112 00
" 315 applicants for examination @ $3	945 00
" 126 applicants for examination @ $1	126 00
Total	$5864 19
Disbursed as per accompanying vouchers Nos. 386 to 429 inclusive	$3077 89
Balance on hand July 7, 1893	$2786 30

The Board has held the regular meetings for examination as provided by law, and also two special meetings made necessary by the large number of applicants. During the year we have examined 473 applicants. Of these, 204 have been granted certificates as registered pharmacists; 102 as registered assistant pharmacists, while 167 failed to make the percentage necessary for registration.

Three certificates have been granted to licentiates of other boards, upon the basis of our interchange proposition.

There are now in force 3119 certificates as registered pharmacists, and 295 certificates as registered assistant pharmacists.

We have received during the year 56 complaints of violation of the law. Of these, 37 have been dropped by the Board because of the lack of evidence. Seven are still in the hands of the Board in process of investigation, and 12 have been turned over to the Attorney of the Board. Six of these have been convicted, 3 have been dropped by advice of the Attorney, and 3 are still in his hands.

We are pleased to report that the operation of the law is most satisfactory in its effect as a protection to the people, that it is constantly raising the standard of education among pharmacists, and that its enforcement is general and satisfactory. Herewith appended, find list of all certificates in force under the law at this date.

Respectfully submitted,

Owosso, July 7, 1893. STANLEY E. PARKILL, *Sec'y.*

On motion the report was received and ordered placed on file with the Secretary.

Meeting adjourned.

SECOND SESSION.

JUNE 20, 1893, 10 A. M.

PRESCOTT: There are a few papers here bearing on the subject of adulterations, that might be read. Mr. Havenhill will read a paper on "Microscopical Examinations of Mustard, Cloves, and Pepper."

MICROSCOPICAL EXAMINATIONS OF MUSTARD, CLOVES, AND PEPPER.

BY L. D HAVENHILL.

THE best treatment of this subject we have ever met with, together with instructions for identifying them is given by Hassall in his valuable work on food; and also in Part II, Bulletin 13, of the Division of Chemistry, U. S. Department of Agriculture. Bibliographies of literature relating to this subject will be found in the above Bulletin and in Blyth's work on food.

MUSTARD as it occurs in the market in the ground condition is always a mixture of *Sinapis alba* and *Sinapis nigra*. The husk or testa should be removed by bolting and the flour should contain no starch.

Twelve samples, retailing at from thirty-five to sixty cents per pound, were obtained from prominent drug and grocery stores and examined. See table on opposite page.

The reason some of the mustards of the market are void of vesicating properties is apparent.

CLOVES.— The unexpanded flowers of *Eugenia Caryophyllata* are not used to any great extent in the powdered condition, and one would naturally conclude that they would not be very badly adulterated. However, of eight samples examined, only one was found pure, and this was of inferior grade, lacking the fragrant odor and peculiar brown color which characterize a first-class sample. Cloves should contain no starch. See table on opposite page.

PEPPER.— The unripe fruit of *Piper nigrum*, which has the largest consumption of any of the spices, was next examined. Five of the twelve samples were pure. This spice is nearly always used in powder, and is quite easily adulterated. The adulterations, however, do not seem to be confined to the powdered article; for in sorting over a sample of unground black pepper for some large specimens, it was found to contain 15% of clay in small pieces, very closely resembling the true pepper. The samples examined, taking into consideration the amount of pepper consumed and the accounts of the numerous adulterants used, averaged better than was expected. See table on opposite page.

Prescott: Value has become entirely fictitious. People sell by name now, and not by article.

President: That accounts for the action of the wholesalers against pure food legislation.

Secretary: An important bill, which aroused the opposition of the wholesale drug trade in general, was what was known as the "Paddock Pure Food Bill." The opposition was not on the ground that pure food legislation is necessary, but was against certain provisions of the bill, which provided for the establishment of a special government department, which should be governed by restrictions and regulations considered unjust. I am inclined to think that opposition to any State bill will always be aroused, until it be possible to get similar bills simultaneously passed in all the States. National legislation of the proper sort would seem to be the correct thing.

Prescott: This is the second time national legislation has been opposed. I don't think it is opposed by the best houses from any intention to put up adulterations. They see certain

(MUSTARD.)

No.	Source.	Price.	Quality.	Admixtures.	Remarks.
1	Grocery.	40	Poor.	Wheat, oat, curcuma.... ...	Unbolted.
2	"	40	Poor.	Wheat, curcuma.....	Unbolted.
3	"	40	N'rly pure.	Corn (trace.).....	Bolted.
4	"	35	Poor.	Wheat, curcuma.....	Unbolted.
5	"	35	Poor.	Wheat, rice.	Bolted.
6	"	40	Fair.	Wheat, curcuma...	Unbolted.
7	"	30	Poor.	Wheat, rice, curcuma.....	Unbolted.
8	Drug st're.	50	Pure.	....	Bolted.
9	"	60	Fair.	Wheat, rice, curcuma.....	Bolted.
10	"	60	Fair.	Wheat, oat, corn.....	Bolted.
11	"	60	Poor.	Wheat, corn, curcuma.....	Unbolted.
12	"	60	N'rly pure.	Only a trace of starch.....	Bolted.

(CLOVES.)

No.	Source.	Price per lb.	Quality.	Admixtures.	Remarks.
1	Grocery.	30	Poor.	Corn, wheat, oat, clove stems.....	Traces of ginger present.
2	"	30	N'rly pure.	Traces of clove stems and starch	Sold for *strictly* pure.
3	"	40	Very poor.	Corn, clove stems and charcoal.....	
4	"	40	Very fair.	Clove stems and starch (traces).	
5	"	40	Pure.	....	Of a dark color; peculiar odor; very oily.
6	"	40	Very poor.	Pea 50 per cent, corn, clove stems.....	
7	"	40	Very poor.	Corn, wheat, pimento, clove stems'	Coarsely ground. No clove tissue identified.
8	"		N'rly pure.	Traces of corn and pimento.	Very coarsely ground.

(PEPPER.)

No.	Source.	Price per lb.	Quality.	Admixtures.	Remarks.
1	Drug store.		Very good.	Corn.....	
2	Grocery.	40	Fair.	Wheat 25 per cent.....	Very coarsely ground.
3	"	40	Very poor.	Wheat, rice, corn, capsicum, charcoal, buckwheat, cocoanut shells.....	
4	"	35	Very poor.	Same as above.....	
5	"	40	Very good.	Ginger, capsicum, pimento.	Slight traces of these spices were detected.
6	"	40	Pure.	.....	
7	"	25	Pure.	....	
8	Drug store.		Fair.	Rye, buckwheat..... ...	Rye predominating.
9	Grocery.	20	Pure.	.....	
10	Drug store.		Pure.	....	White pepper.
11	"		Fair.	Rye, capsicum.....	" "
12	Grocery.		Pure.	....	

provisions in these bills, which they think will be likely to cause them trouble.

Secretary: The Paddock bill was opposed because it did not seem wise to place so much power in the hands of the Agricultural Department.

Prescott: Manufacturers and law makers must come together better before satisfactory results can be obtained.

Secretary: The Paddock bill was drawn up in deference to the wishes of the farmers or the grange element, to whom was attributed the desire for a little legislation to offset the workings of the oleomargerine laws, and these men did not want certain provisions contained in it. Paddock was catering to them in drafting the bill, and he would not allow it to be modified.

Prescott: The Agricultural Department has always been found furthering methods and plans for the lessening of adulterations.

Secretary: The Agricultural Department is well qualified to do work of this nature, but those not intimately acquainted with its workings are aware of this, and scent jobbery in every plan which would give to them duties of this nature.

Stevens: In England they have laws which punish dealers for selling adulterated foods.

Secretary: The milk laws of this country are well enforced, and are becoming more and more strict each year. In our large cities they are well enforced, and it is safe to say that New York has the purest milk in the country. Milk is adulterated, as a rule, by the addition of water, the extraction of a part or all of its cream, or the addition of a little sodium carbonate to keep it from souring. There has sprung up a very large trade in cities, for fresh condensed milk without sugar, and, from my own experience, I can speak for its excellent qualities. Farther than this, condensed creams and condensed milks without sugar are put up in cans, and are meeting cordial recognition.

This was followed by the reading of a paper entitled "Manufacture of Acetamide," by Sheldon Coleman, and a paper by Frederick H. Nickerson, the subject of which was "Examination of the Tincture of Iodine of the Market:"—

MANUFACTURE OF ACETAMIDE.

BY SHELDON COLEMAN.

WHEN engaged in the preparation of an article, we find it both interesting and highly instructive to acquaint ourselves with such literature as may exist concerning the discovery of the article and the various methods of manufacture by which it has since been prepared.

Acetamide was discovered by Dumas Malaguti and Leblanc, in 1847. They were engaged in investigating the action of phosphorus anhydride on ammonium compounds. A full account of their work is given in *Comp. Rend.* of that date under the title of "Researches on the Dehydration of Ammonium Salts and Amines" (Ref. 1).

As the preparation of acetamide was not one of the main objects of their work, it being prepared only that they might make further investigation concerning

the action of phosphorus anhydride upon it, the account says little concerning the method of preparation. It tells us that the acetamide was formed by the action of aqueous ammonia upon acetic ether, by which sufficient quantities for their purpose were obtained, but it is silent concerning the means used in bringing about this action, and also of obtaining the acetamide from the resulting solution. The reaction is shown by the equation, $C_2H_3OOC_2H_5 + NH_3 = C_2H_3ONH_2 + C_2H_5OH$.

It is quite probable that they did not obtain a very pure product, as they gave the melting-point as 78°, which is four degrees below the melting-point of pure acetamide.

The next account of the manufacture of acetamide which we find is given in *Ann. Ch. Phar.* (Ref. 2), in an article by Kündig, entitled, "The Action of Phosphorus Chloride on a Few Amines."

He prepared the acetamide from acetic ether and aqueous ammonia by allowing them to stand in a closed vessel for several months and then vaporizing and distilling the residue.

A modification of this process was published by Hofmann and Buckton in 1856 (Ref. 4.), in which the acetamide was formed by heating acetic ether and aqueous ammonia at 120° for two or three hours in an iron cylinder. The transposition was then complete at the end of six hours' digestion.

In 1875 Smit published a method of manufacturing acetamide by which it was made from ammonium acetate by heating. The ammonium acetate was formed by neutralizing glacial acetic acid with ammonium carbonate on a water bath (Ref. 3.).

In 1882, Hofmann (Ref. 5) formed acetamide from ammonium acetate which he had obtained by passing ammonia gas into glacial acetic acid and neutralizing with stronger ammonia water. This gave 85.7 per cent of the theoretical yield, while an equivalent amount of sodium acetate and ammonium chlorid gave only 77 per cent.

Up to this time an odor resembling that of the excrement of mice had been given as an attribute of pure acetamide in the descriptions of its physical properties. But in 1889 L. Meyer, in an article in *Ber. d. Chem. Ges.* (Ref. 6), refuted this. He had found that acetamide when recrystallized from ether, lost this odor, its other properties remaining unchanged, excepting that the crystals were more fully developed.

The latest article on this subject is by S. Levy (Ref. 7).

He prepared acetamide from ammonium acetate obtained by neutralizing glacial acetic acid, heated on a water-bath, with ammonium carbonate.

He then commenced distillation at once. Some acetamide came over at 160°, but only that portion of the distillate coming over above 180° was retained. About 30 per cent of the theoretical yield was obtained by this method. He purified the product by recrystallizing from ether or benzine.

A list of the references quoted above, with others, is found at the close of this work.

In the present instance acetamide was prepared in a manner differing somewhat from any of the preceding methods.

Dry ammonia gas was passed into warmed glacial acetic acid, and the neutralization completed by adding stronger ammonia water.

The ammonium acetate prepared in this manner was then heated for five or six hours at 250°, the flask containing the ammonium acetate being connected with a large reverse condenser.

A part of the ammonium acetate was thus changed into acetamide and water according to the equation $NH_4C_2H_3O_2 = C_2H_3O_2NH_2 + H_2O$.

The flask then contained acetamide and a solution of ammonium acetate.

Distillation was commenced, and that portion coming over above 180° retained separately. It entirely solidified upon cooling. The remainder of the distillate was then resubjected to the same treatment, and that portion coming over above 180° collected and added to the product retained before. This entire product was then redistilled to insure purity, and that portion coming over above 180° retained. This was dried over sulphuric acid.

The yield, when prepared in this manner, is from 75 to 80 per cent of the theoretical yield.

The product is a white crystalline solid, quite deliquescent, and soluble in alcohol and water. It melts at 82° C.

A portion of the product dissolved in benzine, in which it is but slightly soluble, recrystallizes in long needle-like crystals which are without odor.

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2. Kündig (1858) *Ann. Ch. Phar.*, 105, 277.
3. Smit. (1875), *Bull. Soc. Chem.*, 24, 540.
4. Hofmann, Buckton (1856), *Ann. Ch. Phar.*, 100, 181.
5. Hofmann (1882), *Ber. d. Chem. Ges.*, 15, 980.
6. L. Meyer (1889), *Ber. d. Chem.-Ges.*, 22, 26.
7. S. Levy (1890), *Anleitung zur Darstellung Organische Praparate*, p. 21.
8. Roscoe and Schorlemmer, *Org. Chem.*, 3. pt. 1, 113.
9. Watts, *Chem. Dict.*, 1, 4.
10. Richter, *Org. Chem.*, p. 259.
11. Cohen, *Pract. Org. Analys.*, p. 127.
12. Reynolds, *Experim. Chem.*, pt. 4, p. 113.
13. Bernthsen, *Org. Chem.*, p. 180.

EXAMINATION OF COMMERCIAL TINCTURE OF IODINE.

BY F. H. NICKERSON.

THE United States Pharmacopœia requires that tincture of iodine shall contain 8%, by weight, of iodine. In order to ascertain how closely the commercial article conforms to this standard, I have subjected a number of samples to quantitative analysis. Tincture of iodine usually contains varying percentages of hydriodic acid, due to a reaction between the iodine and its solvent. Ethyl iodide has also been reported as being present, but this statement is not confirmed by later investigators. It is then necessary, not only to estimate the free iodine of the tincture, but also that which has entered into chemical combination. This quantity has been reported by Göpel,[1] Grubourt,[2] and Carles;[3] the last, finding in tincture of iodine, which had been exposed to the light in a colorless flask for ten months, 1.12% of hydriodic acid. This statement has been copied by both the United States and National Dispensatories as "only $\frac{1}{12}$ of 1%." The amount of the acid present is largely influenced by the age of the tincture, the degree of light to which it has been exposed, and by the alcoholic strength of the solvent. Probably there would be little or no loss of iodine in this way, if the tincture were kept in the dark. I find in commercial tincture of iodine as high as .48% of hydriodic acid.

Assay Method. — A weighed amount of the tincture is titrated with solution of sodium arsenite, whose iodine equivalent has been carefully determined, using starch solution as an indicator. This gives the amount of free iodine in the liquid. The iodine in another weighed portion of the tincture is now, by the addition of excess of solution sodium arsenite, reduced to sodium iodide. Excess of solution of silver nitrate is added, precipitating *all* of the iodine as silver iodide. The solution is now strongly acidulated with nitric acid, dissolving both the silver arsenite and the silver arsenate, formed by the addition of the silver nitrate, while the silver iodide being insoluble in dilute nitric acid is unaffected. The precipitate is collected on a weighed asbestos filter, dried at 150,° and weighed.

This gives the total amount of iodine present. Subtracting from this the amount present as free iodine, gives the quantity present as hydriodic acid. Working with known quantities of iodine and potassium iodide, I find this method to give satisfactory results. I append the results of twenty analyses : —

[1] Göpel, 1850, *Pharm. Cent. Blat.*. No. 13.

[2] Grubourt, *Journ. de Pharm.*, 3, 113.

[3] Carles, 1874, *Bull. de la Société de Pharm. de Bordeaux*, 14. 169; *Pharm. Journ. and Trans.*, 3d Ser., 5, 88.

Sample No.	Free Iodine. Per cent.	Hydriodic Acid. Per cent.	Total Iodine. Per cent.
1	7.01	.27	7.27
2	6.53	.13	6.65
3	6.85	.35	6.69
4	5.42	.48	5.88
5	4.63	.29	4.90
6	5.61	.42	6.02
7	6.64	.08	6.72
8	7.22	.11	7.33
9	4.86	.39	5.25
10	4.82	.18	5.00
11	6.07	.00	6.07
12	3.77	.29	4.05
13	5.35	.00	5.35
14	7.08	.00	7.08
15	5.65	.05	5.70
16	7.23	.23	7.45
17	5.14	.00	5.14
18	5.78	.14	5.92
19	6.17	.07	6.24
20	5.94	.31	6.24

President: Really, there are but two samples which could be considered as adulterations. It would seem that there is no intentional adulteration by dealers.

Eberbach: Some dealers have two grades of tincture of iodine. I have known it to be sold for five cents an ounce.

Following this was read a paper on "Incompatibilities," by Silas G. Wertz.

CLASSIFICATION OF INCOMPATIBILITIES.

BY SILAS G. WERTZ.

Incompatibilities are of three classes:—

1. Chemical incompatibilities,— in which the ingredients contained in the mixture undergo transposition or decomposition.

2. Physiological incompatibilities — those in which the transposition, or decomposition, form compounds which produce no effect, or different from that desired.

3. Mechanical incompatibilities (or immicable mixtures) are liquids or semi-solids, which are immicable in the desired mixture.

But not all chemical transposition of the ingredients in the prescription are incompatibilities, as in a great many cases this is the aim of the prescriber.

We also have chemical incompatibilities in which the solubility of the compound formed will be sufficient to allow the formula to hold it in solution, and yet give no visible sign of any incompatibleness, and yet it is contained in the liquid, and the dose of the desired prescription in this case may be a faulty one. Example — liquor strychnia, with sodium acid carbonate ($NaH\ CO_3$).

Mr. H. Campbell [Amm. Jour. Phar., Vol. 60, p. 351] points out *four rules* to govern the dispenser in presenting incompatible prescriptions.

1. If any dangerous compound may be expected to occur after the medicine has left the dispenser, some precautions should be taken to obviate such danger; and in most cases the precaution would take the form of a warning to the prescriber.

2. To dilute the suspected ingredients before mixing.

3. To mix them cold.

4. When strictly necessary to use mucilage, preferably that of tragacalth, in order to retard decomposition, or to suspend a precipitate.

E. B. Stuart [Phar. Record, 1891, 398] reports that the reactions occurring when the following prescription is compounded are simple, and should be under-

stood by any one familiar with chemistry. Nevertheless the prescription is an interesting one from the number of distinct incompatibilities it presents, being about as many as there are ingredients in the mixture.

℞	Tinctura ferri chloridi	℥ss
	Sodii hyposulphitis	℥ss
	Potassii chloratis	℥ij
	Quinia sulphatis	gr. xv
	Aquæ	℥ij

The original dispenser mixed the several articles *secundum artem*, save the water, a portion of which was used to dissolve the hyposulphite. The several reactions are as follows: On adding the solution of the hyposulphite to the tincture of iron, the brown color of the latter is quickly changed to a pea-green, characteristic of the ferrous compounds, and at the same time a slight milkiness due to the separation of sulphur occurs. The ordinary tests for ferric iron, show that all the ferric salt has been reduced to the ferrous. At this point, the mixture probably contains ferrous chlorid, sodium sulphate, and sodium thio-sulphate, the reaction being as follows: $2Fe_2Cl_6 + 2Na_2S_2O_3 + 2H_2O = 4FeCl_2 + 2Na_2SO_6 + HCl + S_2$. The hydrochloric acid set free is immediately decomposed by the thio-sulphate, detected by the evolution of SO_2. These two decompositions leave about 60 gr. of thio-sulphate undecomposed. On adding the potassium chlorate (180 gr.) this remaining quantity of thio-sulphate is entirely decomposed, and the ferrous chlorid is again oxidized to ferric chlorid. One molecule of potassium chlorate will give up enough oxygen to convert six molecules of the ferrous chlorid, to the ferric salt. The six molecules of free hydrochloric acid will be sufficient to satisfy the increased valence of the ferric iron. Inasmuch as the acid set free by the reduction of the ferric chlorid originally used, was destroyed by the thio-sulphate, at least one third of the iron will be precipitated as oxide, as shown in the following equation: $6FeCl_2 + KClO = 2Fe_2Cl_6 + Fe_2O_3 + KCl$, or probably two thirds of the iron will be precipitated as oxychlorid and one third remain in solution as chlorid. In either case the amount of potassium chlorate decomposed is the same, amounting to only 1½ grains and leaving an abundance for the decomposition of the remaining 66 grains of sodium thio-sulphate which is probably oxidized to sulphate, as follows: $6Ha_2S_2O_3 + 3KClO_3 = 6Ha_2S_2O_4 + 2KCl + 3S_2$. Not quite eleven grains of potassium chlorate are required to decompose the above quantity of crystallized sodium thio-sulphate, making a total loss of about 12½ grains of chlorate; leaving a large excess after the quinine is added. Further, owing to the insolubility of the chlorate of this alkaloid, it changes its acid radical with the potassium chlorate, forming an equivalent quantity of potassium sulphate. This is especially noticeable if the quinine salt is dissolved before adding to the mixture. Our curious and unusual series of reactions are now complete, and the vial contains ferric chlorid and oxychlorid, precipitated sulphur, sodium sulphate, and sodium chlorid; potassium sulphate, potassium chlorid and potassium chlorate, and quinine chlorate.

The question as to what the physician (who is responsible for this aggregation of incompatibilities) intended to administer, remains a mystery; that of the expected effect upon the patient, has excited the curiosity of several members of the profession. With these questions the pharmacist is, perhaps, not legitimately concerned, and the average medical student continues to look upon the time he is obliged to spend in the study of chemistry while in college as simply wasted.

An important incompatibility: The death of a child was caused not long since, by the physician's ignorance of the fact that chlorate of potassium and iodide of iron are incompatible. The reaction between these two compounds precipitates the iron as the sesqui-oxide, setting free the whole of the iodine, according to the equation, $2FeI_2 + KClO_3 = Fe_2O_3 + KCl + 4I_2$.

This incompatibility has been pointed out repeatedly, but is not always borne in mind by the physician or the dispenser.

The incompatibility of calomel and iodoform may be represented by the following equation: $3Hg_2Cl_2 + 2CHI_3 = 3Hg_2I_2 + 2CHCl_3$, the product being

mercurous iodide and chloroform. These changes are effected by light and air; prolonged exposure producing advanced changes, with the formation of mercuric salts, etc.

Incompatibility of borate of sodium and cocaine. According to Levialiant, a pharmacist of Crepy en Valois, these substances are generally mixed for Collyria, and give a precipitate of cocaine. A few drops of glycerin added to the mixture will keep it unchanged.

THE ART OF DISPENSING.

Many decompositions are intentional, such as in mist. ferri co., B. P., or in the frequent combination of tincture of opium with solution of sub-acetate of lead for injections; also in the following: —

Ext. conii	℥ss
Liq. plumbi subacet	℥ss
Aquæ	ad ℥vj

In this case the abundant precipitate renders it almost creamy, and necessitates mixing half the water with the extract, and the remainder with the liquor, before mixing, or a disagreeable lumpy mixture is produced. Such combinations may be dispensed as written, and sent out with a "shake" label. Occasionally, however, the decompositions are of such a character that the chemist may feel pretty sure that the writer of the prescription is unacquainted with the reaction, or has overlooked it. For example: —

Sodæ sulphat	grs. xv
Pottass. cit	grs. xx
M. Ft. pulv. Mitte	vj
Zinci sulphat	℥j
Plumbi. acetas	℥ij
M. Ft. pulv. Mododict. utend	

In these cases metathesis takes place, the water of crystallization of the sulphate is liberated, and the mass becomes wet. The use of an equivalent quantity of the dried salts removes the difficulty.

Liquor plumbi subacetatis, and acetate of lead, are incompatible with infusions of opium, the vegetable astringents, soap, milk, or albumen.

Alkaloids, whether alone or as salts, are nearly all precipitated from their solutions by tannic acid. They are, therefore, incompatible with this acid, and also with the various astringent vegetables containing it. Perchloride of mercury, Donovan's solution, free iodine, and double iodides also precipitate the alkaloids.

Almond emulsion is separated by alcohol, tinctures, oxymel, and syrup of squills, spirits of nitrous ether, hard water, and cream of tartar, which are more or less inimical to all emulsions.

Chloroform, if in a mixture containing opium or its preparations, will dissolve the narcotine, and, unless perfectly mixed, may cause an overdose of this or some other alkaloid soluble in that vehicle, to be given at the last dose.

A mixture containing liq. strychninæ, spt. ammon. arom., and spirit chloroform should have a "shake" label placed upon it. A case has occurred where the chloroform was in part deposited, and carried down with it in solution some of the strychnine, which was set free by the ammonia.

In a paper by Mr. Henry Campbell on Incompatibilities (the *Chemist and Druggist*, April 28, 1888, p. 561), it is pointed out that although bicarbonate of soda is generally considered to be incompatible with liquor strychninæ, it does not follow that the strychnine will always be precipitated; the following mixture, for example, remains clear: —

Liquor strychninæ	m. v.
Soda bicarbonatis	gr. xv.
Aquae	ad. ℥i.

The dose of the strychnine solution contains $\frac{1}{2\frac{1}{2}}$ gr. of alkaloid, forming in the ounce mixture a solution of the strength of 1 in 9600, while the solubility of the alkaloid in water is about 1 in 5700.

DISPENSING OF INCOMPATIBLES. (THE ART OF DISPENSING.)

It is not easy to lay down any rule for the dispenser when he comes across a case of incompatibility. In such cases he will do well to consider, previous to compounding the prescription, such questions as the following: (1) Was this incompatibility foreseen and intended by the prescriber? (2) Does it in any way endanger the health of the patient? (3) Is it necessary to trouble the prescriber (supposing he can be communicated with) regarding the incompatibility? (4) Can the incompatibility be avoided in any way? The subjoined cases are given as illustrations of these remarks:—

Magnes. carb	℥ij
Acid. sulph. dil.	℥iss
Magnes. sulph.	℥iss
Quinine	℈ss
Aq. menth. pip.	ad. ℥iv

Now, as sulphate of magnesia is already ordered in the prescription, it is improbable that the prescriber intended to prepare a further quantity of the salt by extemporaneous preparation. Further, the prescriber probably adds the acid merely to assist the solution of the quinine, and, although it is added in excess in this instance, it is generally in all quinine mixtures. Lastly, there is the probability that the magnesia carbonate was intended to act as an antacid: so that, everything considered, there was no difficulty in substituting q.s. of acid to dissolve the quinine for ℥iss. On the whole, however, it is better to omit the acid altogether, because the soluble sulphate of quinine will be decomposed by the magnesia carbonate. It answers well to rub the quinine to fine powder and suspend in the mixture along with the carbonate.

Mucilag. acac.	℥j
Sodæ hyposulphit.	℥iv
Oil. menth. pip.	m.xij
Liq. bismuthi. (B. P. 1867)	℥iss
Liq. morph. hydrochlor.	℥ij
Aq.	ad ℥vj

This will form a clear mixture when first dispensed, but after an interval, depending on the purity of the ingredients, it will turn, first brown, and then quite black, and finally become quite unfit for use. Decomposition will be retarded if an equivalent amount of pure gum arabic be added, instead of mucilage, and of pure muriate of morphine instead of the official solution; and, above all, if the solution of bismuth be rendered decidedly alkaline.

The following is a prescription which was given by the Illinois State Board of Pharmacy at an examination:—

(1) Tinct. ferri. mur.	℥ij
(2) Spt. æther. nitrosi.	℥ss
(3) Mucilag. acaciæ.	℥j
Syrupi q. s.	℥iij

It is in the ordinary sense of the term, incompatible, but Mr. Joseph Ince, commenting upon it, says that, made most ways, it assumes the form of a thick jelly, which may be sent out in a covered pot. Reason thus: Here are three ingredients likely to react upon each other, of which mucilage is chief. There are ten drachms of protective agent (syrup), so mix ℥ij with the tincture, ℥iij with the spirit of nitrous ether, and ℥v with mucilage, which wants it most. Combine the three solutions, and a beautiful preparation is the result.

The following is given by Mr. Campbell. It shows how the order of mixing effects the result.

Liquoris hydrargri perchloridi	℥j.
Ammoniæ carbonatis	gr. v.
Potassi iodidi	gr. v.
Aquæ	ad. ℥j.

Although an alkaline carbonate forms a precipitate with mercuric chlorid, still, if in the above mixture the first and third ingredients be mixed, and the solution of the carbonate then added, no precipitate occurs. If common water be used, a slight precipitate of calcium carbonate forms, but it is free from mercury.

EXPLOSIVE AND INFLAMMABLE COMPOUNDS.

Whenever substances rich in oxygen, or easily deoxidized, are ordered to be mixed with other ingredients, the dispenser should always carefully consider the order of mixing. Such substances should never be *rubbed* with easily oxidizable bodies.

Substances which easily part with their oxygen are picric acid, and chlorates, iodates, bichromates, permanganates, nitrates, and picrates of potash, nitrate and oxide of silver, chlorate of calcium, etc. Such substances should first be rubbed to a powder in a mortar, then mixed with the safe ingredients, and lightly mixed with the easily oxidizable substances by means of a wooden rod. Of the latter may be named charcoal, organic powders, iodine, sulphur, sulphides, ethereal oils, and ammonia salts.

Oxide of silver, if to be combined with any organic substance, should first be dampened with water; if creosote is ordered with oxide of silver in a pill, it will explode. Pills containing oxide of silver are liable to inflame, if they become warm. They have been known to take fire in the pocket, causing severe burns.

Nitrogen Compounds.—Tincture of iodine and ammonia are often prescribed together, and iodide of nitrogen is produced under certain conditions. An explosion has resulted from the preparation of the following prescription, iodide of nitrogen being evidently the cause:—

Iodi	℥ij
Lin. camph. co.	℥j
Lin. saponis co.	℥j

A concentrated solution of iodine and potassium iodide was filtered through paper. The next day the filth was touched with a view to being removed, when the paper and funnel were shivered into atoms with a loud explosion.

Sulphate of morphine and acetate of ammonia. After the acetic acid is neutralized, an excess of acetate of ammonia will precipitate the morphine, and an overdose is likely to occur. Calomel and potassium iodide, in the stomach, undergo a double decomposition with the formation of a very irritating mercurial compound. Geo. F. H. Markoe (Phar. Record, 1885, p. 237) states that chloral hydrate should never be dispensed with any preparations containing alcohol, potassium bromide, sodium bromide, sodium chlorid, and magnesia sulphate. The alcohol in this mixture combines with the chloral hydrate to form chloral alcoholate [$C_2HCl_3O.CH_6O$] which separates in two layers, the alcoholate floating upon the surface as a straw-colored liquid.

The chloral alcoholate acted as a hipnotic but was disagreeable to the taste, and harsh in its action, leaving unpleasant after effects.

Cocaine hydrochlorid is incompatible with sodium bromide. The alkaloid forming, with the bromide, a precipitate which finally separates and floats on the liquid.

Antipyrin Incompatibilities: — Antipyrin is incompatible in aqueous solutions, forming precipitates, first, with concentrated solution of carbolic acid; second, tannin and preparations containing tannin; third, tincture of iodine; fourth, corrosive sublimate. The following form color reactions; alcoholic so-

lution of ethyl-nitrite, yellow; ammonium alum, dark yellow. Acid solution of amyl nitrite, green; hydrocyanic acid, yellow; chloride of iron, blood red; sulphate of iron, yellowish brown; syrup of iodide of iron, reddish brown; sulphate of copper, green; nitric acid, light yellow. In the dry state, antipyrin gives with calomel, a poisonous compound; with beta-napthol, a moist mixture; sodium bicarbonate, an odor is devolved resembling that of acetic ether; with sodium salicylate, a mixture is obtained from which an oily liquid separates; quinine and its salts, and caffeine are rendered more soluble with antipyrin.

Dr. Pindell (*Phar. Jour. Vol. 18, P. 524*) says that strychnine, when mixed with fat, is reduced to almost one sixth of its physiological effect, as shown by experiment. Potassium iodide and syrup of iodide of iron (ferrus) precipitate the ferrous hydrate and ferrous carbonate, which is due to the presence of a carbonate in the potassium iodide, as impurity, and the ferrous hydrate is precipitated by the free alkali, which is also generally present in commercial samples of iodide. If the potassium iodide is neutral, the solution will be yellow instead of green; the yellow is due to an iodate, and the green color to ferrous hydrate.

Wertz: I was unable, owing to the short space of time, to do much work with this. The subject is one which requires a good deal of time.

Secretary: I would like some of you boys to draw up as complete a list as possible of incompatibilities.

Wertz: It would be a good year's work for one to do.

Eberbach: Is there any trouble with strychnine and bromine, or bromides?

Wertz: There is a good deal of trouble, for the last dose is likely to be a dangerous one on account of the microscopic crystals of strychnine bromide which are present and are easily overlooked.

ASSAY OF COD-LIVER OIL EMULSIONS.

BY WELLES B. NEWTON.

An easy and quick method for the estimation of oil in cod-liver oil emulsions was the object in view when this article was first conceived. Mr Magelvoort in his article (*Am. Jour. Phar.*, June, 1890, p. 289) on "A Quantitative Estimation of Cod-Liver Oil in the Malt Extracts," says he can find no reports on the assay of these preparations. His is the only article I have been able to find up to the present time. His method requires, perhaps, a longer period of time than the average pharmacist would wish to give the subject, requiring three or four days' time for the different manipulations.

I have tried two methods: first, the Adams method for the estimation of fats in milk as modified by Allen & Chattaway in *The Analyst* (April, 1886, p. 71). They take a piece of filter paper fifteen inches long, by three and one half inches wide, an ordinary white string is threaded down the sides about a half inch from the margin, at one corner of which is left a small loop; this is then coiled around a small rod beginning at the loop end, the whole of which is enclosed in a filter paper of sufficient size, and tied with the loop end up. This should fit easily in a Sohxlets tube. To the paper cone I added a small piece of cotton below the coil, and one at the top of the coil in place of the rod, to prevent the emulsion flowing through the center of the coil. This is now exhausted with ether in the Sohxlets tube. The cone is removed and the ether allowed to evaporate. Three or four grams of emulsion are taken in a small beaker and diluted to the consistency of thin cream with water, 2 or 3 c.c. usually being sufficient. The thin emulsion is poured slowly on the top of the cone until all is absorbed, the cone and beaker being then dried in an air bath at from 60°–70° C. by hanging from the loop. When dried and cooled, the coil is placed in the extraction apparatus, the beaker rinsed out two or three times with ether, which is added to the extraction apparatus. Sufficient ether is added for repercolation and the whole is ex-

hausted, eight or ten repercolations usually being sufficient. Should the emulsion contain extract of malt or glycerin, shake out in a separatory funnel with three or four portions of water. Decant off the ether into a tared 100 c.c. flask, and rinse out the separatory funnel with two or three portions of ether, decanting each of these into the flask. Now connect the flask with a condenser and distil off the ether on a water bath. Should the flask contain a little water, heat in an air bath at from 100°–110° C. until all water is driven off. Lastly, weigh the oil and calculate the per cent.

Second Method.— This is very similar to the first. About 5 gms. are taken, weighing by difference in a weighing bottle, this is added to sufficient white sand to fill a Sohxlets tube about a half inch below the upper bend of the siphon tube. The sand should have been treated with dilute hydrochloric acid, and thoroughly washed, until on stirring with water, it is perfectly clear, and little or no sand is held in suspension on allowing to stand for a moment, then dry. This is primarily to clean the sand, and second, to rid the sand of the very fine particles. The dried sand and emulsion are triturated in a porcelain dish until thoroughly mixed, and dried on a water-bath. When dry or all water is driven off, it is again triturated until fine and the whole loosely placed in the Sohxlets tube, at the bottom of which has been placed some asbestos wool. The pestle and evaporating dish when cooled are rinsed out with two or three portions of ether; this is added to the extraction apparatus and enough more ether for repercolation. Six or eight repercolations are usually sufficient for complete exhaustion. An emulsion which dries very hard requires a greater number of repercolations than one which does not dry hard. The etherial solution is transferred to a separatory funnel, when it is washed several times with water. The water is drawn off and the ether decanted into a tared 100 c.c. flask, the separatory funnel is rinsed out several times with ether and the ether added to the flask. Connect the flask with a condenser and distil off the ether, then place the flask in the air bath, heat to 100°–110° C. to drive off any water held by the ether. Weigh and calculate the per cent of oil.

In a 33% emulsion I was able to extract 32 % by both methods, and in a 46.6% emulsion the first method gave 45.6% and the second 45.8%. The emulsions were made with acacia by the formula in the National Formulary, which was harder to extract than any of the patent preparations I have examined, unless it was one with malt extract.

Of the two methods tried, I consider the latter preferable, as it involves less work and time, it not being necessary to make a coil or dilute the emulsion, nor does it take as long to dry the emulsion before exhausting with ether.

The pharmacist might dispense with the extraction apparatus by triturating in a mortar with ether after drying with sand as described. Decant off the ether, through a filter, asbestos wool being very good, as it takes out all fine particles held in suspension. In this way, by triturating with three or four portions of ether, I think it would be completely exhausted. The etherial solution could be washed in a bottle and decanted into a tared flask or beaker and evaporate, or distil off the ether with hot water. Of course this would necessitate the waste of an unnecessary amount of ether, but I can see no reason why the method will not give close results if care be taken in the different manipulations.

In the table below, the later method was used for the estimation.

No.	Per cent Cod-liver Oil.	
1	47.9	No claim.
2	44.7	" "
3	44.5	Claimed to contain 50 per cent oil.
4	30.1	No claim.
5	41.6	" "
6	26.9	" "
7	65.5	Claimed 66 per cent oil.
8	37.6	" 50 " " "
9	42.2	" 50 " " "

Number four was very poorly emulsified, though it had not spoiled. From the odor, oil of wintergreen, sassafras, and cinnamon were the principal flavors. In one hydrocyanic acid, either free or as wild cherry, was noticeable. In two the oil was disguised by adding perhaps citric or tartaric acid, though they were not nearly as palatable as some of the others.

Secretary: None of the samples are very far off. None said to contain 30% and found to contain but 10%. Is there any way of determining whether it is pure cod-liver oil or some other kind of oil?

Newton: Only by the appearance of it.

Meeting adjourned.

THIRD SESSION.

JUNE 20, 1893, 2:30 P. M.

President: The Constitution provides that the election of officers shall take place at the third session of the Association, but I think it might be as well to postpone that matter until later. There are no members of the Executive Committee present, and I think perhaps it would be better to let the election of officers go over until to-morrow. We will now hear the Secretary's report.

SECRETARY'S REPORT.

To the Members of the Michigan State Pharmaceutical Association:

The Secretary begs to submit his annual report. The past year has been a very quiet one in pharmaceutical matters in this State. The Secretary was enabled to get out the annual volume of proceedings free of cost to the Association, though, as there was considerable delay in collections, etc., it was quite impossible to mail the book as promptly as was wished. However, all copies were sent out during the spring. One was mailed to each member of this Association, but it was discovered that owing to some accident to the mails, one sack was lost. There was no way of ascertaining what copies were contained therein, other than a more or less imperfect guess based upon a knowledge of the order in which the wrappers were mailed and the copies posted. The Secretary's impression is that about one hundred members have not received a copy of the proceedings. He has been notified by half a dozen members, of this failure, and copies have been promptly sent; and as he has an extra supply of the books on hand, he would request all who have not received it to notify him, that a copy may be sent.

When the last annual report of the Secretary was rendered, there was shown a balance of $489.64. Within a few days after the meeting, however, bills came in which exhausted this balance, with the exception of $19.80, and it was found necessary to withdraw $18 of this sum for postage and other necessary expenses, which amount, however, was duly refunded by the Secretary's personal check. It is seen, then, that the Secretary has had no funds to work upon, other than those which came in through the payment of dues (a very inconsiderable sum), and the amount he, himself, was willing to advance. The Secretary has assumed all expenses, paying all bills as promptly as the convenience of his own finances would permit. Owing to this stringency, there was some delay in sending out the notifications of dues, but there has been collected, up to date, sufficient money to defray all expenses, including last year's meeting and the present one as well, leaving an indebtedness of the Association to the Secretary, of $144.43.

As said, this is the only obligation which the Association now has, and for this sum the Secretary is content to wait, until the condition of the treasury allows its payment. There are some $300 which should easily be collected prior

to January 1, of dues up to the close of 1893. Hence, the prospect is that the new year can be started with a very respectable balance, to be later increased by 1894 dues. Following is an account of the receipts and expenditures of this office: —

RECEIPTS.

Balance on hand, Aug. 2, 1892	$489 64	
Dues received Aug. 2, 1892 to June 20, 1893	254 80	
Total		$744 44

DISBURSEMENTS.

Date.	Voucher.			
Aug. 3, 1892,	31,	Secretary's expenses to date	$144 84	
" 4, "	32,	Secretary's salary	225 00	
Sept. 10, "	33,	J. D. Muir, local Secretary	50 00	
" 19, "	34,	H. Whittaker, stenographer	50 00	
June 20, 1893,	35,	Grace Blindbury, stenographer	25 00	
" " "	36,	Secretary's expenses to date (itemized bill herewith)	136 83	
" " "	37,	J. Topping, printing	8 00	
" " "	38,	H. J. Brown, engrossing certificates	4 90	
" " "	39	C. W. Parsons, portion of salary	80 57	
Balance			19 80	
Total				$744 44

In the above statement it will be observed that, differing from former custom, there are included in this statement all expenses connected with last year's meeting, and, in addition, those incident to this gathering. This step has been taken after consultation with several members of the Executive Committee and the President, with the intent, if possible, to clear up all indebtedness and show a working balance. This has practically been done, and hereafter, it is believed, the executive work of the Association can be carried on much more satisfactorily.

Being authorized by this body at its last meeting, the Secretary prepared a tasty receipt for dues, in colors, costing less than two cents each, and covering the period decided upon for our Association year; viz., from January 1 to December 31. It is believed that the receipts have proven acceptable.

Deceased Members. — There have been two deaths of members during the past year, which have filled the members of this Association with sorrow. The saddest, and one on which I do not like to speak very much, was that of W. J. Smythe, a valued member of this Association. He was found dead in bed at St. Louis, whither he had gone to take charge of Meyar Bros. Drug Company's Laboratory. The second death was that of R. Bruskie, of Bay City, April 6. He was a member of our Committee on Membership, I believe, and appropriate mention of this will be made in the volume of proceedings.

The membership list has been increased up to to-day by the addition of sixteen names, as follows : —

LIST OF NEW MEMBERS.

F. H. Borradil, Detroit,
D. A. Cornell, Copemish,
W. H. Dendel, Hopkins Station,
F. C. Gidday, Detroit,
F. P. Potter, Allegan,
J. W. Rothacher, Detroit,
S. R. Smith, Grand Rapids,
C. C. Sherrard, Detroit,
E. T. Van Ostrand, Allegan,
C. E. Van Sickle, St. Johns,
A. B. Wooston, Morenci,
S. Colemon, Kalamazoo,
S. P. Whitmarsh, Palmyra,
F. R. Perry, West Bay City,
D. C. Scribner, Grand Rapids,

June 19, 1893.

C. W. PARSONS, *Sec'y.*

Secretary: I am informed by some of the members of the executive committee that they have some more names to hand in. Mr. Jas. E. Davis, the chairman of the committee, wished me to say for him, that, owing to his numerous duties, among them being the superintending of a new building and acting in the capacity of president of the National Wholesale Druggists' Association, his time is entirely occupied, and he has been obliged to delegate his work in connection with this Association to others. The committee, with one exception, is composed of traveling men. I would suggest, or recommend, that in the selection of members of the various committees of this Association, we choose men who are not so scattered through the country that it is impossible for them to meet. In that way we will be able to get more work out of our committees. It would be well, I think, to have our executive committee composed of men who would have no trouble in meeting. Our financial condition is such that it is absolutely necessary to increase the membership. The only way in which it can be done, is by personal solicitation, and I offer as a recommendation, that the membership committee consider this matter, and adopt some plan by which they can get better results.

President: I suppose the regular course would be to refer this report to the executive committee. What is the pleasure of the Association?

Sherrard: I suppose a committee should be appointed.

It was moved and carried unanimously that the chairman should appoint a committee of three, to whom the reports of the Secretary and Treasurer were to be handed for approval.

President: I appoint Messrs. Stevens, Eberbach, and Inglis.

Prescott: I desire to present for honorary membership, the name of Dr. Hoffman of New York.

Dr. F. Hoffman was duly elected.

Then followed the reading of the treasurer's report.

TREASURER'S REPORT.

RECEIPTS.

		Dr.
1892		
Aug. 8,	To balance on hand	$489 64
1893		
June 21,	To cash	136 33
"	"	8 00
"	"	4 90
"	"	25 00
"	"	80 57
Total		$744 44

DISBURSEMENTS.

		Cr.
1892		
Aug. 5,	By paid warrant, No. 31	$144 84
"	" " " " 32	225 00
Sept. 13,	" " " " 33	50 00
Sept. 21,	" " " " 34	50 00

1893			
June 21,	By paid warrant,	No. 35	25 00
"	" " "	" 36	136 33
"	" " "	" 37	8 00
"	" " "	" 38	4 90
"	" " "	" 39	80 57
Balance on hand			19 80
Total			$744 44

Respectfully submitted,

June 21, 1893. WM. DUPONT.

Next the reading of paper on the "Isolation of the Tannin from Tea and Coffee," by Wm. Scherer.

THE ISOLATION OF TANNIN FROM TEA AND COFFEE.

BY WILLIAM SCHERER.

TANNIN.

Tannin, a substance of great importance both medicinally and in the arts, can be found in almost the entire vegetable kingdom; its principal source being from *Quercus Lucitanica*. Our first knowledge of tannin began about the year 1795, from which time on, it has greatly increased; and among the first to work upon this subject may be mentioned Dr. Lewis, to whom English writers on tannin ascribe the honor of having a part in its discovery. Among others are Scheele, Dize, Dryeux, a French chemist, Cartheuser, Rouelle, Macquer, Mounet, and Giannoti; but it is principally Scheele, Berthellot, and Fourcroy to whom we are indebted for the positive knowledge of tannin, which at those times was known to chemists as "principle astringent."

Hoping that you are familiar with the properties of tannin or tannic acid, I shall proceed to explain my work. My intention at first was to obtain, or better to manufacture tannin from tea, coffee, Paraguay tea, and guarana; but finding that I would have sufficient work with tea, I spent about eight weeks' work upon it, and, I am sorry to say, did not obtain any good results after trying various methods.

EXPERIMENTS WITH TEA AND COFFEE.

Method A.— I took about eight ounces of tea and poured upon it a large amount of water (cold), about twenty liters; then heated it to the boiling point and continued it about an hour; then allowed it to cool. Strained and filtered out the leaves, and at once treated the decoction of tea with lead acetate, and immediately treated this tannate of lead, thus formed, with H_2S (hydrogen sulphide). Then I filtered out the lead sulphide and evaporated the filtrate in air to a very dark brown, amorphous mass, which I tried to purify, my object being to obtain perfectly pure tannin; and according to authorities, pure tannin is a colorless, amorphous mass.

I took the brown mass, dissolved it in water, added sodium chlorid, and tried to obtain tannin by shaking out with ether; but could not obtain any, the brown mass still remaining.

I then tried to shake out the aqueous solution of the brown mass with ether, to remove any gallic acid that might be present, but it seemed to have no effect.

I then proceeded to obtain the tannin by another method.

Method B.— I made a decoction of tea as in "*Method A*," strained and filtered it. It is well to remember that a decoction of tea is one of the most difficult things to filter, taking from one to two days, depending on the amount. The filtrate I treated with a small portion of lead acetate, rejected the precipitate

rejected, and the filtrate was again precipitated, and the second precipitate was thoroughly and rapidly washed to remove any foreign matter, and to prevent the decomposition of the tannate of lead. I then suspended the precipitate in water, and decomposed it with H_2S; filtered out the lead sulphide and treated the fluid several times with ether (removes gallic acid), obtaining a perfectly clear, colorless solution. This solution I started to evaporate on a water bath and in a vacuum, but the least heat applied turned the solution to a yellow tint. However, I continued to evaporate, and obtained a thin syrup of red-brown color. I then removed the last traces of water over sulphuric acid in a vacuum, and obtained a dark brown, amorphous mass, as in "*Method A*," and after trying the various methods for purifying tannin, obtained no better results than with the first.

Method C.— This method is precisely the same as "*B*," with the exception that I evaporated the aqueous solution obtained after decomposing with H_2S, filtering and shaking out with ether, with a current of dry, hot air, as suggested by Dr. Prescott, but with no better results than in any of the other methods

Method D.— I extracted the tea several times with rectified spirit, filtered, and evaporated the alcoholic solution in a vacuum to a small bulk, treated this extract with a considerable portion of water, filtered the solution thus obtained, and fractionally precipitated it with a solution of lead acetate; rejected the first precipitate, as it contains coloring matter and pectineous principles, then washed the subsequent second precipitate of lead tannate as rapidly as possible, suspended it in water and decomposed it, with H_2S (hydrogen sulphide). I then filtered out the lead sulphide and treated the filtrate several times with ether, removing the ether after each shaking (using separating funnel). Then I evaporated the aqueous solution to a thin syrup, and removed last traces of water over sulphuric acid in desiccator. This method seemed to work nicely, and my aqueous solution, obtained after thoroughly shaking out with ether, was perfectly colorless and aslo gave all the reactions for tannin, but on evaporating, turned to a very dark brown mass, as was the result with the other methods.

Method E.— This method is precisely the same as "*Method D*" with the exception that instead of evaporating the last aqueous solution obtained in air, I evaporated it in a vacuum, but with no better results than in "*Method D.*"

COFFEE.

The method I intended to follow for coffee was as follows. Owing, however, to lack of time, I was unable to try it: —

Method.— Extract the powdered green coffee (previously deprived of its fat by extracting with ether) several times with a mixture of one part of water and three parts (90%) alcohol. Filter and precipitate the filtrate fractionally with a solution of lead acetate, rejecting the first portion; wash the second precipitate, suspend in water, decompose with H_2S, filter off the *lead sulphide*, evaporate to a syrup, and allow to evaporate over sulphuric acid in a vacuum.

In working with tea everything seemed to work well up to the evaporation of the solution of tannin obtained after decomposing the tannate of lead. In every method tried the solution came out perfectly clear and colorless; but on evaporation or the least application of heat, I obtained a dark red-brown, amorphous mass which would not answer well to the properties of tannin, such as reactions, etc. It is astringent and turns dark green on addition of Fe_2Cl_6, and to some extent precipitates alkaloids, *but very slightly*. This change of color is brought on gradually, beginning with a pale yellow.

I have come to this conclusion, that if the solution could be evaporated at a very low pressure, at about 30° or 40° C., a colorless, amorphous mass might be obtained; for in my last method ("E") I evaporated the solution of tannin at 75° C., and obtained a somewhat lighter colored mass. I at first thought that this coloring was due to foreign substances, such as coloring matters, etc., but on trying to dispose of the color with various methods, I found I could do nothing with it, for it would remain *brown*. It is undoubtedly the heat that decomposes the tannin, producing a dark red-brown color.

REFERENCES.

1. Dragrndorf's Plant Analysis, pages 38–48; 152–175.
2. American Journal of Pharmacy, Vol. xxxviii, page 504.
3. Richter's Organic Chemistry, pages 784, 785.
4. Prescott's Organic Analysis, pages 465–485.
5. Fluckiger and Hanbury Pharmacographia.
6. Wittstein's Chemical Constituents of Vegetables. (In general.)
7. Hussman's Pflautzen Stoffe. (In general.)
8. Allen's Commercial Organic Analysis.
9. The Tannins, by Henry Trimble (entire book), published 1892.
10. Government Report, Bulletin 13, pp. 875–932.
11. Received some valuable information from Mr. Wm. H. Krug, of Washington, D. C. (Chemical Dep't.)

School of Pharmacy, University of Michigan, June 15, 1893.

Prescott: The Mr. Krug mentioned in this paper is one of our graduates. He has quite a responsible position at Washington, D. C., and is the author of several pamphlets. Mr. Morris will now read a paper on "Volatile Oils, their Distillation and Purification." Mr. Morris and Mr. Jackson worked together on this subject. This report which Mr. Morris will read is a brief one, and he presents samples. Obtaining strictly pure samples of volatile oils for investigation is a difficult matter, because of the doubt which rests upon all commercial samples. Often they are not pure.

DISTILLATION AND PURIFICATION OF VOLATILE OILS.

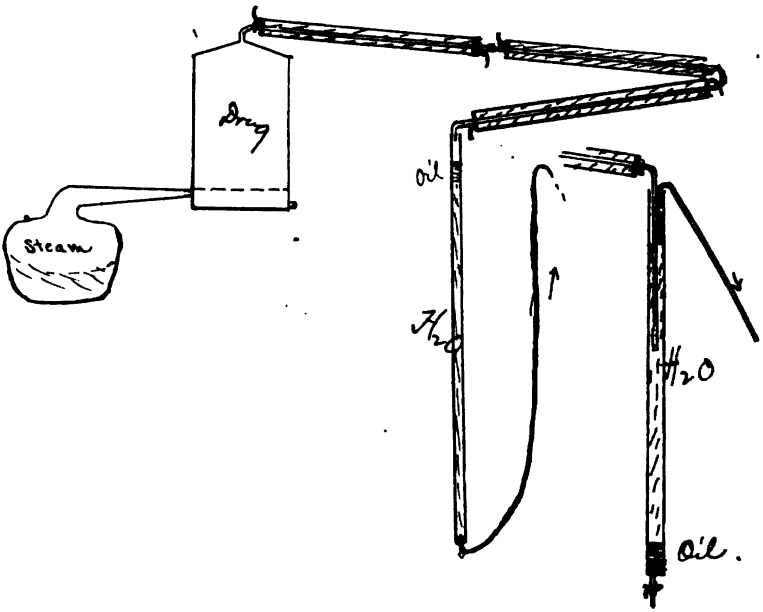
BY G. A. MORRIS AND C. E. JACKSON.

THE distillation was by means of steam under slight pressure, the apparatus being suggested by an article by Albert M. Todd[1] and consisting of a steam generator, a can to hold the material to be distilled, condensers, and separator. The can for the drug was of tin, about twelve inches in diameter and twenty inches deep, having a tight-fitting, conical-shaped cover, with an outlet tube one inch in diameter in the center, for the escape of steam after it has passed through the drug. The can has a perforated, movable false bottom about two inches from the true bottom. Just beneath this false bottom is a tube one inch in diameter for the entrance of steam from generator, and on the opposite side close to the true bottom is another small tube for drawing off the water collecting in the can, due to a slight condensation of the steam in passing up through the drug. An ordinary five-gallon copper retort was used as a steam generator.

The material is packed in the can, the cover placed securely on, and the outlet tube connected with the condenser. The condenser was an improvised "Liebig," 2 in. in diamater, its length about 12 ft. The separator[2] was a glass tube 5 ft. in length and 1 in. in diamater. For the oils lighter than water, a small rubber tube was connected with the bottom of the separator, its outlet about 6 in. from the top of the separator; the separated water flowing out through tube, the oil floating on the top of the water. For oils heavier than water, the glass tube was connected with the end of the condenser, and run down into the separator 18 or 20 in. below the surface of water in it. The separated water was drawn off the top by means of a syphon.

1 Prac. Am. Ph. Assoc. Vol. 36, p. 160 (1886).

2 Natl. Dispensatory, 1884, p. 1023.



The material distilled being unadulterated, the only impurities in the oils were the water they would absorb, and the mechanical impurities which might get in during distillation. The latter were removed by filtration, and the former by either fused calcium chlorid, ether, or gelatin. (See table below.) The materials were all in a dry condition, and no doubt some of them lost some oil in the drying process, especially is this true of wintergreen and horsemint. The distillation was not made with a view to quantitative estimation of the per cent of oil.

The first portion of distillate contains the most oil, the amount gradually decreasing. In most cases the steam was passed at least 6 hours.

In the distillation of oil of wormwood, the oil coming over first was of a brown color, that coming over later changing to green.

Birch.— As the oil does not pre-exist in the bark, but is developed on the addition of water,[1] it was macerated twenty-four hours, then placed in the can, and steam passed through it twelve hours, the water in which it was macerated being used in the steam generator. Considerable difficulty was experienced in separating the oil and water, especially when distilled rapidly, and it was found necessary to introduce a second separator like the first, the water from the second separator being returned to the steam generator. The same difficulty was experienced in separation of oil of wintergreen.

[1] Natl. Dispensatory, 1884, p. 317.

Oil.	Color.	No. fl.oz. obtained.	Lbs. drug distilled.	Water removed by.	Part of plant used.
Allspice (Eugenia pimenta.)	Reddish.	1¼	5	Ether.	Fruit.
Star anise (Illicium anisatum.)	Light y'llow.	2	5	$CaCl_2$.	Fruit.
Birch (Betula lenta.)	Colorless.	½	10	$CaCl_2$.	Bark.
Caraway (Carum carui.)	Light y'llow.	3	4	$CaCl_2$.	Fruit.
Red ced'r w'd (Juniper's Virgini'na)	N'rly col'ess.	5	10	$CaCl_2$.	Wood.
Cubeb (Cubeba officinalis.)	Greenish.	2	2½	Ether.	Fruit.
Dill (Anethum graveolens.)	Light y'llow.	2	5	$CaCl_2$.	Fruit.
Eucalyptus (Eucalyptus globulus.)	Reddish.	¾	3	Gelatin.	Leaves.
Fennel (Fœniculum vulgare.)	Colorless.	3	5	$CaCl_2$.	Fruit.
Horsemint (Monarda punctata.)	Light y'llow.	¼	5	Gelatin.	Le'v's and tops.
Juniper (Juniperus communis.)	Colorless.	¾	5	$CaCl_2$.	Berries.
Laurel (Laurus nobilis.)	Light y'llow.	1½	10	$CaCl_2$.	Leaves.
Lavender (Lavandula vera.)	"	¾	7	$CaCl_2$.	Flowers.
Rosemary (Rosmarinus officinalis.)	"	2	8	$CaCl_2$.	Leaves.
Spearmint (Mentha viridis.)	"	1	10	$CaCl_2$.	Le'v's and tops.
Savin (Juniperus sabina.)	Reddish.	¼	5	Ether.	L'v's and twigs.
Sassafras (Sassafras officinalis.)	Light y'llow.	12	10	$CaCl_2$.	Bark of root.
Thyme (Thymus vulgaris.)	"	1	5	$CaCl_2$.	Tops.
Worm-seed (Artemisia maritenia.)	Red'sh y'l'w.	1	5	$CaCl_2$.	Unexpanded flowers.
Worm-wo'd (Artemisia Absinth'm)	Green.	¼	5	Ether.	Tops.
Wintergr'n (Gaulth'ria procumbe's)	N'rly col'ess.	⅛	10	Ether.	Leaves.

Dr. Prescott then read a paper written by Mr. F. A. Thompson, of Parke, Davis & Co.

HYDRASTIS CANADENSIS.

BY F. A. THOMPSON.

Golden seal, introduced to the medical profession about forty years ago by the Eclectics, has become one of the leading drugs of the materia medica. For its complete botanical, medical, and pharmaceutical history, consult "Drugs and Medicines of North America." It is my intention in this paper, not to discuss the various constituents of this drug as to their characteristic reactions, or make a special study of them, but to present briefly the results obtained in assaying the drug, ground ready for manufacture of galenical preparations, and several fluid extracts, made by the leading manufacturing pharmacists.

Golden seal contains three alkaloids, namely: Berberine, $C_{20}H_{17}NO_4$; hydrastine, $C_{21}H_{21}NO_6$; and canadine, $C_{21}H_{21}NO_4$; the latter having been in dispute for some time, and its presence but recently established by F. Wilhelm and E. Schmidt. Canadine is present, however, in but small quantities, and therefore may be ignored in the estimation of berberine and hydrastine. The most important constituent of this drug is its *hydrastine*, based on the medical reports, and it is this on which we are to judge of the quality of the drug or any preparation made from it.

Assay of the Drug.— Ten grammes of the drug in a moderately fine powder is exhausted with strong alcohol by hot repercolation, requiring two or three hours; percolate cooled and diluted to 100 c.c. with same menstruum; 25 c.c. of this tincture is placed in a suitable flask; 1.3 c.c. HCl, U. S. P., 0.2 c.c. H_2SO_4, and 12.5 c.c. concentrated ether, are added; and the mixture allowed to stand twenty-four hours in a cool place, with frequent shaking. At the end of this time, transfer the crystals to counterpoised filter-papers, washing them with a mixture of equal volume of concentrated ether and strong alcohol until filtrate gives no acid reaction. Dry crystals at 105° C., weigh, and multiply weight by 0.9017 to obtain the amount of berberine alkaloid, and then multiply that result by 40 to ascertain the percentage.

The filtrate from berberine estimation is rendered nearly neutral, evaporated to a small volume, solution cooled and transferred to a separator; and the resi-

due remaining in evaporating-dish is thoroughly washed with slightly acidulated water till free from alkaloid, the washings added to the separator. Render the fluid alkaline with solution of ammonia, and extract the alkaloid with several portions of chloroform, evaporating the chloroformic solution to dryness at a low heat, protected from light. Redissolve in acid water, transfer to 2-oz. prescription vial and wash with ether, rejecting the same. Reprecipitate alkaloid with ammonia water, and extract with several portions of ether. Evaporate the ethereal solutions in a shallow crystallizing-dish. Now dissolve the residue in 10 c.c. $\frac{N}{20}$ H_2 SO_4 (a small amount of ether facilitates the solution of the alkaloids); add 20 or 30 c.c. water, 2 drops of cochineal tincture 1:10, and determine the free acid by titration with $\frac{N}{100}$ sodium hydrate solution. Each c.c. of $\frac{N}{100}$ H_2 SO_4 neutralized by the alkaloid represents 0.00383 grammes hydrastine, and the amount multiplied by 40 equals the percentage in the drug.

In all my results here, I have worked duplicate assays, and have also tried several duplicate assays for the hydrastine by the following modification, which has given equal results, and which, being much shorter, I feel confident will prove the better method of the two. It is as follows:—

After neutralizing filtrate in berberine estimation, and reducing to a small volume, it is mixed with 8 or 10 grammes of sawdust (previously treated with alkaline water and alcohol to remove extractive matter), the mixture dried, placed in a suitable 4-oz. flask or bottle, and 100 c.c. of modified Prollius mixture[1] added. After macerating several hours, with frequent shaking, 50 c.c. of the clear ethereal fluid is transferred to a beaker, evaporated to dryness at a low temperature, redissolved in acid water and ether, and transferred to a 2-oz prescription vial, and from this step on treated the same as in the other process.

Examination of Ground Drug.

Number.	Per cent. Berberine calculated from dried (105° C.) berberine muriate.	Hydrastine by weight.	Hydrastine by titration with N-100 H_2SO_4
No. 1	3.8	2.	1.76
No. 2	4.15	2.8	2.50
No. 3	3.18	2.52	2.3
No. 4	3.24	2.32	2.1
No. 5	3.48	2.7	2.5
No. 6	3.89	2.48	2.25
No. 7	4.06	2.8	2.5
No. 8	3.	2.3	2.18
No. 9	3.1	2.3	2.16
Average	3.48	2.47	2.27

[1] Ether ... 250 c.c.
Chloroform ... 100 c.c.
Alcohol ... 25 c.c.
Conc. ammonia ... 10 c.c.

The above results are much higher in berberine and hydrastine than any recorded. Lloyd reports, in "Drugs and Medicines of North America," a practical manufacturing yield of 1.8 per cent. monosulphate of berberine, equivalent to 1.39 per cent. berberine alkaloid, and hydrastine crystals from 0.25 to 1 per cent. A yield of 3 to 3.5 berberine muriate can be readily obtained on practical scale, also a much larger amount of hydrastine, having obtained 3.6 grammes of beautiful white crystals from 200 grammes of drug, or 1.8 per cent.

FLUID EXTRACT GOLDEN SEAL U. S. P. AND WITHOUT ALCOHOL.

Assay.— 10 c.c. of either preparation is placed in a 100-c.c. graduated flask; about 75 c.c. of alcohol is added, and the mixture digested on a water bath for twenty or thirty minutes. After cooling, sufficient alcohol is added to dilute to

100 c.c. This alcoholic solution is then treated the same as the tincture obtained in the assay of the drug.

Examination of Fluid Extract Golden Seal, U. S. P.

Number.	Per cent. Berberine calculated from dried (105° C.) berberine muriate.	Hydrastine by weight.	Hydrastine by titration with N-100 H_2SO_4
No. 1	2.13	2.2	1.96
No. 2	2.7		2.5
No. 3	1.88	1.86	1.22
No. 4	2.52	1.98	1.87
No. 5	2.52		2.45
No. 6	1.73	1.3	1.16
No. 7	1.89	1.74	1.62
Average	2.19	1.71	1.82

The above fluids represent the leading manufactures. Van Ledden Hulsebosch, Amsterdam (*Pharm. Weekblad*, March 21, 1891), reports a yield of 3.43, 2.34, and 3.63 of berberine, and 2.14 and 1.71 per cent. hydrastine (by weight), in three different lots of fluid extract of his own make, and 1.86 and 2.71 per cent. berberine and 1.46 and 1.74 per cent. hydrastine in two samples made by other pharmacists. L. van Itallie, Amsterdam (*Pharm. Weekblad*, April 4, 1891), found in various fluid extracts of hydrastis, 2.21, 2.52, 1.42, and 1.79 per cent. hydrastine, by weight. The above results on hydrastine by weight would necessarily be higher than those obtained by titration with volumetric acid solution, due to some impurity present in the alkaloid. A standard fluid extract should contain not less than 2 per cent. hydrastine, based on titration with volumetric acid.

Fluid Extract Golden Seal, without Alcohol.

Number.	Per cent. Berberine calculated from dried (105° C.) muriate.	Per cent. Hydrastine by titration with volumetric acid.
No. 1	1.46	1.3
No. 2	2.	1.3
No. 3	0.65	0.61
No. 4	0.66	0.46
No. 5	0.12	0.72
No. 6	0.54	0.69

This preparation is used much more extensively than the pharmacopœial extract, and therefore should be much richer in hydrastine than shown in the above results, which show up the quality of the preparation as made by five different leading manufacturers.

Analytical Laboratory of Parke, Davis & Co.,
Detroit, June 16, 1893.

President: We will now hear from the committee appointed to look over the reports of the Secretary and Treasurer.

Stevens: The committee has looked over the report as carefully as possible in the short time allowed them. We find the

bills and reports correct, so far as we have had time to examine them. In one or two cases, however, there are little items of expense for which we see no bills. We would like to have the bills for them.

Secretary: You shall have them. There are some little items, such as postage, for which I never had any bills.

Stevens: There are one or two bills which do not appear in this report,—that for the publishing of the proceedings and the Secretary's salary.

Secretary: The Secretary wishes to say that he will wait for the balance of his salary. The vouchers drawn and appearing in the report cover all expenses attaching to last year's meeting and to this one as well, and the only indebtedness to be discharged is the balance of the Secretary's salary. The amount necessary for this will be easily collected during this summer, and leave, to commence our new year January 1, a small working balance, which will be increased to a goodly sum by the yearly dues which become due at that date; so that a very encouraging report can be read at our next meeting. The volume of proceedings was gotten out without cost to the Association, as sufficient advertising was sold to defray the expenses, leaving a profit of a trifle over $1 which was expended by the Secretary for necessary postage, and does not appear in his report. Attached to the Secretary's report, is a bill duly receipted, covering the publication of the proceedings, which is handed over simply for report.

President: There was a motion made and carried yesterday to have ready for the Association to-day, resolutions and thanks to persons whose courtesies we will accept. The secretary has suggested that Dr. Prescott be appointed to do this.

Prescott: I am quite at your mercy, gentlemen.

Dr. Prescott was appointed to make a draft of resolutions.

President: Gentlemen, do you wish to continue the session?

Motion made and carried to adjourn.

FOURTH SESSION.

JUNE 21, 1893, 9:30 A. M.

PRESIDENT: The Constitution provides that the election of officers shall take place at the third session of the annual meeting of the Association, but it was thought best yesterday to postpone that portion of the business until to-day.

Gundrum: Mr. President, I think there are a good many members around the grounds, who would like to take part in the election of officers.

President: Mr. Gundrum, please take a stroll around the grounds and find them.

(Mr. Gundrum does so and soon returns).

President: Two more. Mr. Gundrum, you have done well.

Gundrum: There are two more who will be here in a moment.

President: What is the pleasure of the meeting?

Gundrum: I move that we proceed with the election of officers.

President: You have heard the motion; all in favor, please signify by saying, Ay — contrary, No. The motion is carried. The first officer to be elected, I suppose, is the President. Do you wish to do this by ballot?

Vernor: Do the rules of the Constitution provide that he shall be elected by ballot?

President: I believe so. They usually have been elected by ballot. Prepare your ballots for President, gentlemen.

Gundrum: Mr. Chairman, I move that the Chair appoint two tellers.

Carried.

President: Well, I appoint Mr. Gundrum and Mr. Reidy.

Vernor: I move that we proceed to an informal ballot.

Carried.

President: Has the Executive Committee reported on those new names?

Secretary: All but two, which came in this morning.

President: Before we take up this ballot, I think it would be well to vote in all new members.

List read and motion to elect all carried.

Gundrum: Mr. President, the tellers are ready to report.

Total number of votes	18
Parker	2
Parkill	3
Webb	3
Stevens	4
Peck	1
Bassett	1
Parsons	1
Eddy	1

Vernor: I move that Mr. Stevens be elected President for the ensuing year.

Motion carried, and Mr. Stevens elected President.

Vernor: I move that the Secretary be instructed to cast the ballot of the Association in favor of Mr. Webb for first Vice-President.

Motion carried, and Mr. Webb elected first Vice-President.

Vernor: I move that the second Vice-President be appointed in the same manner, by the Secretary casting a ballot for A. S. Parker of Detroit.

Motion carried, and Mr. Parker elected second Vice-President for the ensuing year.

Another ballot cast resulted in favor of John E. Peck of Grand Rapids, for third Vice-President.

President: Tellers please pass ballots. Gentlemen, prepare your votes for Secretary.

Vernor: Mr. Chairman, as a matter of fact, Mr. Parsons has refused to be re-elected Secretary on account of his health. It is absolutely necessary to have a Secretary who would take an active interest in the work which former secretaries have undertaken. We ought to select some man that we know, and I would like to see some names mentioned. I would like to make a nomination myself. The gentleman is not present, but I refer to Mr. F. A. Thompson, of Detroit, chemist for Parke, Davis & Co.

I think that this office is one which we should be particularly careful about, for upon the work of the Secretary depends the future success of the Association. I should be glad to hear from any one else in the matter.

Prescott: I quite agree with what has been said in regard to this office. I think that I have said at former meetings that this is the office for which we should secure the best service. While I might be inclined to support the nomination which has already been made, I think that other names might be mentioned, and I beg to nominate for Secretary, Mr. S. E. Parkill.

President: I must decline to be considered. Don't want to. I have served my time.

Prescott: Well, is it absolutely necessary to release Mr. Parsons? The matter of course rests with him, but I would like to have him continue in office.

Secretary: I must refuse the honor. I am engaged in the getting out of a semi-monthly paper, and as you probably know, the work is arduous. My health has been poor for some little time, and, in performing my duties as Secretary of this Association, I have had to work nights and Sundays. I have n't even time to get acquainted with my own family. There is considerable collection in connection with this office, which must be done, and I do not think it justice to myself or to my employer to take any additional work.

Vernor: I can vouch for the truth of Mr. Parsons' remarks as to not being able to get acquainted with his family. He tried his best to get his family to come up on the boat last night to meet him, but they would n't come.

President: Any further names to be mentioned, or any suggestions before we proceed to a ballot?

Gundrum: I move, Mr. Chairman, that the Secretary be instructed to cast a ballot for Secretary.

Motion carried, and Mr. F. A. Thompson was elected Secretary for the ensuing year.

Secretary: I move that Mr. Dupont be continued in the office of Treasurer.

Motion carried.

President: The matter of the local Secretary should be determined, I suppose at the next session. The Executive Committee is elective. I wish to suggest that in choosing an Executive Committee, it would be well to elect men who are

so situated that a quorum could easily meet. The Committee is composed of five members. Mr. Bassett represents the Executive Committee as its chairman.

Vernor: I move that he be made chairman of the Executive Committee.

Motion carried.

Bassett: At the present time I am not engaged in pharmaceutical work, my time and attention being taken up otherwise, and I think that some one else should be appointed chairman of this committee. I have somewhat lost track of the business throughout the State, and I should like to be released from the position.

President: Gentlemen, what is your pleasure regarding other members of this committee?

Stevens: I would suggest the name of Mr. J. J. Crowley, of Detroit, for a member of the Executive Committee.

Elected.

Vernor: I beg to suggest the name of Mr. F. W. R. Perry, of Detroit.

Elected.

Dupont: I name Mr. M. Reidy, of Corunna.

Elected.

Secretary: We have with us, as new members, Mr. Perry of West Bay City and Mr. Coleman of Kalamazoo. I should like you to consider their names.

Gundrum: I name Mr. Lyman Beach, of Bay City, and move that the Secretary be instructed to cast a ballot in his favor.

Elected.

President: That, I believe, constitutes the list of executive officers.

Secretary: There was read yesterday a communication from Prof. O. Oldberg. He asks the Association to see that three delegates and three alternates be appointed, etc., and the names reported to him.

Bassett: I move that this Association appoint three delegates and three alternates to the meeting. This will be one of the greatest meetings ever held. There will be present chemists and pharmacists from all over the world, and it strikes me that the Michigan Association has always held up its end in the A. P. A. meetings, and that the selection of these delegates and alternates should be left to this meeting.

Gundrum: Mr. President, I nominate for one, Dr. Prescott.

Prescott: Mr. Stevens, Mr. Schlotterbeck, and I have been elected delegates from the School of Pharmacy, U. of M., but I leave it to you whether you wish to appoint me your delegate.

Vernor: Under those circumstances, without disrespect to the three delegates, would n't it be well to have three others appointed and make you three gentlemen their alternates? Then some of you would be sure to be there.

Prescott: That is entirely satisfactory to me.

Mr. Eberbach, of Ann Arbor, Mr. Parkill, of Owosso, and Mr. Parsons, of Detroit, were appointed as delegates to the International Association, with Messrs. Sherrard, of Detroit, Vernor, of Detroit, and Goodrich, of Hillsdale, as alternates.

Stevens: I have one or two suggestions to make. I think that, in electing officers, it would be well to keep outside of those who have already served. I have not been President, but I have been first Vice-President, and I think here is ground for declining. There is a good deal of work to be done in connection with the office of President, and I do n't think that I have the necessary time to devote to it.

President: I do n't see that there is any particular force in Mr. Stevens's action. The first Vice-President does not have any more to do than any ordinary member of the Association.

Vernor: I hope that he will reconsider his action. I do n't think it is detrimental to the interests of the Association to elect the same man over and over. The men who attend the meetings are the men who have the interests of the Society at heart. I trust that Mr. Stevens will withdraw his action.

Stevens: I hope that I will always be an active member of the Association, for it does n't look well to see, among those who have dropped out of the Association, the names of ten, fifteen, or twenty ex-presidents.

Bassett: I think that Mr. Stevens ought to come up and shoulder this work.

Stevens: Mr. Bassett did n't even want to serve on the Executive Committee.

Gundrum: I would like to speak a word on the point. I think Mr. Stevens is mistaken as to the duties of the President. The work of that office is not heavy like that of the Secretary. I did n't find it a heavy office when I was President. I do n't think he will find it so if he undertakes the work. I know he has a lot of work to do at the U. of M., but he won't find the work of President so hard as he thinks it is. He has done much service — as much as any one member of the Association. That I know, and I am sure that he is perfectly capable of getting up an annual address to the Association without much trouble. I hope Mr. Stevens will allow his name to stand.

Mr. Bassett reads the report of the EXECUTIVE COMMITTEE, which was read and placed on file:—

Your committee held no meetings during the year. Secretary Parsons, Local Secretary Vernor, and A. Bassett met in Detroit to formulate arrangements for this meeting, which proved satisfactory to the entire committee.

H. G. COLEMAN,
Chairman Ex. Com.

Mr. Bassett reads letter from Seabury & Johnson.

NEW YORK, April 13, 1893.

Michigan State Pharmaceutical Ass'n., Mr. C. W. Parsons, Sec., Detroit, Mich.

DEAR SIR :— At the earnest solicitation of some of the State Pharmaceutical Associations, we have determined to offer a prize of a Histological Microscope,

valued at $75 for the best essay by a member of a Pharmaceutical Association on "Substitution; its Relation to the Health of the People, and the Best Means for its Prevention." The papers must be forwarded to Seabury & Johnson before September 1, 1893, the judges to make the award being a select committee of three members of the College of Pharmacy of the City of New York, and the paper of the successful contestant to be read before a meeting of the Association to which he or she may belong. Very truly yours,

SEABURY & JOHNSON.

President: Do you wish to take any action on this matter?

Prescott: I move that the Secretary send our grateful acknowledgment to Messrs. Seabury & Johnson.

Secretary: It was acknowledged at the time of its receipt, but only formally. Must have papers received before September 1, of this year.

Bassett: I see no reason why members of this Association should not enter into competition.

Prescott: I change my motion that the Secretary send our acknowledgment to Messrs. Seabury & Johnson, to a motion that we accept this offer.

Carried.

Bassett: I move that Mr. Parsons be requested to publish this article in the *Era*, in order that it may be well advertised throughout the State.

Secretary: We shall have a report of this meeting in the *Era*, and there will be appropriate mention of this article.

INTERSTATE RETAIL DRUGGISTS' LEAGUE.

PRESIDENT — Thomas Layton, 2745 N. Grand Ave., St. Louis, Mo.
VICE-PRESIDENT — Dr. D. F. Goodyear, Memphis, Tenn.
SECRETARY — G. Howard Willett, 701 Walnut St., Kansas City, Mo.
TREASURER — Geo. W. Sloan, Indianapolis, Ind.
EXECUTIVE COMMITTEE — *Tennessee* — E. W. Gordon, Nashville; *Illinois* — W. F. Bodeman, Chicago; *Kentucky* — Robert J. Frick, Louisville; *Indiana* — H. E. Zimmer, Indianapolis; *Ohio* — C. T. P. Fennel, Cincinnati; *Kansas* — W. C. Schodd, Leavenworth; *Iowa* — J. W. Ballard. Davenport; *Missouri* — J. A. Gallagher, Kansas City.

To the Retail Druggists of the Mississippi Valley.

The evil of price-cutting on patent medicines and proprietary articles has existed for a number of years, and has become unbearable. Price-cutting on patent and proprietary goods has been indulged in by the grocers, general merchandise stores, trade bazaars, department stores, dry goods stores, and druggists. In very few instances only did druggists start the nefarious practice, the initiate being generally taken by the other concerns named. Patent and proprietary articles are used by these concerns simply as bait. In large distributing centers, especially, has price-cutting become so prevalent that retail druggists are forced to do something to protect themselves. Many so-called efforts have been made to help the poor druggist. He has received abundance of advice, and the subject of helping him has been spoken and written about *ad nauseum*. In this instance, as in most others, he only is helped who helps himself.

This the druggists of eight of the States of the Mississippi Valley — Ohio, Tennessee, Illinois, Kentucky, Indiana, Kansas, Iowa and Missouri — have started to do. These States sent delegates to a convention which was held at St. Louis, Sept. 3, 1891.

The Interstate Retail Druggists' League was formed, officers and an executive committee duly elected, and everything set in motion which was thought necessary to secure the object in view.

The League has taken a most decided stand, and asks all druggists throughout the Mississippi Valley, yea, throughout the whole land, to organize and join hands.

This is our platform: —

We hereby agree to withdraw our patronage from any wholesale dealer or jobber who knowingly and willfully furnishes cutters with any merchandise whatsoever. We also agree to discontinue the sale of any patent or proprietary articles furnished to cutters by manufacturers or through their agents.

This is what we intend to do to cure the evil of price-cutting. There is no ambiguity about it — nothing about it which is secret, or hidden, or hard to explain. Our plan is simple, straightforward, and to the point, and if followed to the letter, will bring relief.

We would say to all brethren of the profession, also to those who are not affected by the cutter: "*Give us your support and help us annihilate the cutter.*"

Yours fraternally,

C. HOWARD WILLIT, *Sec'y.*

CONSTITUTION.

1. This organization shall be known as the Interstate Retail Druggists' League.

2. The objects of this League shall be to promote the trade interests of the retail druggists.

3. The officers shall consist of a President, Vice-President, Secretary, Treasurer, and Executive Committee.

The Treasurer shall give bond in such amount as is determined by the Executive Committee, the League paying for the same.

4. The officers shall be elected by ballot, and shall serve for one year, or until their successors are duly elected and qualified.

5. The Executive Committee shall consist of the officers of this League and one representative from each State, to be nominated by the delegate of said State and elected by the League. In case of failure of any State delegate to select a member in that committee, this League shall elect the delegate from the State.

6. The Executive Committee shall be empowered to make an assessment, not to exceed one dollar per capita per annum.

7. The membership shall consist of delegates of local organizations of the various States represented in this League, and one delegate shall be apportioned for each one hundred members, or fraction thereof, it being understood that a fraction is not less than twenty-five.

8. Nine members shall constitute a quorum for the transaction of business, provided five States are represented.

9. Amendments to this Constitution may be made by a two-thirds vote at any regular session, notice being given at a previous session.

Bassett: The special importance of this communication, sent to us by the officers of the I. S. D. L., is its aim to get us to organize an International State League. We have n't time for such a discussion now.

President: We might take some action.

Bassett: The I. S. D. L. is a power throughout the country, They recently had a meeting in Chicago, which was very interesting, and I presume there will be some good results from it. It was fairly represented at Montreal, and it probably will be at Detroit this year. Active members of the league think they have struck the right thing to remedy some of the existing evils of the drug trade. I think it would be good subject matter for discussion. I think the commercial side of the question is the one live interest of the Association. It requiries a good deal of discussion and would want to be very carefully considered

before any action is taken. I do n't think we have any time for it this morning.

Crowley: I move that the pay of the local Secretary be not abolished, but be continued the same as formerly.

Vernor: In regard to the pay of the local Secretary, it has been $50 expense to the Association each year, and is entirely unnecessary. The Association is in no condition to pay out $50, as the Treasurer can tell you. I trust that you will, at this time, establish the precedent of not paying the local Secretary. For my part, I will say that I will turn the money back if it is voted to me. There is nothing to prevent your establishing the precedent now, at this meeting. The result will be the same anyway, and if you do n't, you may find it hard to do at some future time. I hope the motion will be withdrawn.

Secretary: Mr. President, Mr. Vernor and I have talked the matter over, and I agree with him in the main, but I think that any personal expense which he has been put to should be refunded. It ought to be easy to get a man who would be interested enough in the Association to do the work of our local Secretary, without any hope of a reward for his services. I think that if Mr. Vernor has gone to any expense, he should have the amount of it returned to him.

Vernor: In regard to the matter of expense, I will say that Mr. Bassett said that he would accompany me around among the wholesalers of Detroit and see what they would do in regard to entertainment. They agreed to pay all bills for entertainment, but did n't want to entertain themselves. In consequence, I have a fund sufficient to provide for the entertainment of four times the number of people we have here, and the only thing that troubles me, is that I will have to give back some of the money.

Bassett: I do n't agree with Mr. Vernor in regard to the pay of the local Secretary. I think that it is right to pay the local Secretary for his services. I know that Mr. Vernor has both pockets lined with money, and he does n't want the salary, but when we do n't find a man of such enormous wealth, and where a man has to take time from his business to do the work, I think that it is not right that he should not have a salary. I think that he should be paid. I think he is entitled to it, and that he will work the better for it. I think that it would be a dangerous experiment to abolish the salary of the local Secretary. As regards funds, I understand from the Secretary that we have, this year, practically paid the bills of last year's meeting and this year's as well, and that we will have a small balance in the treasury, January 1.

Gundrum: I think that Mr. Vernor in the main is right. I do not wish it to be understood that I think the local Secretary should not be paid the amount of any expenses he goes to. So far as that is concerned, I am willing to reach down in my own pockets and pay these necessary expenses, but I do n't

like the idea of paying this salary every year. The first year we did not pay the local Secretary anything. He did a great deal of work and the next year went on, not expecting to be paid for his services. Some of the members said he ought to be paid, and he was paid $50 for the first and second years' services. He was a poor man and was very thankful for the money. Since then, we have always paid the local Secretary a salary of $50 per year. If we had as much money in the treasury as we had at that time, I would have nothing further to say, but members are continually dropping off, and we have very little money. If Mr. Vernor is satisfied to do the work for nothing and make a donation of the expenses, it is very generous of him, and I move that the offer of the local Secretary be accepted with the thanks of the Association.

President: We will have to accept this proposition of Mr. Vernor's whether we want to or not. We are paying this year's expenses by assuming that we will collect $150 dues, and you can see that with the necessary expenses, we could not pay this $50.

Vernor: Mr. Gundrum has struck the key-note of the situation, and I think that the precedent could be established here as well as anywhere, that the local Secretary be instructed to notify the Executive Committee of the expenses, and that the Executive Committee recommend that they be allowed or not, each year. I would simply say that there were no expenses and the Executive Committee would so report, and the matter would be dropped.

Crowley: I withdraw my motion.

Gundrum: I renew my motion. I offered a resolution that the proposition of Mr. Vernor, that he donate his services, and all that he had done in incurring expense, be accepted with the thanks of the Association.

Vernor: If you will permit me — that would make it a matter of record, and I don't wish it to appear on the books that I am doing the magnanimous. I would rather that you would adopt a resolution that the local Secretaries be instructed to hand in their statements to the Executive Committee for their approval, and warrants drawn if necessary.

Motion carried.

Prescott: I have prepared a draft of resolutions, which I am sure will meet with your hearty co-operation: —

WE, the members of the Michigan State Pharmaceutical Association, in attendance at its eleventh Annual Meeting desire thankfully to acknowledge our indebtedness to those whose liberality and care have provided for the great enjoyment and profit of this meeting of the Association. We have been the recipients of special favors and advantages. We are indebted to generous friends of pharmacy in Michigan: —

To Messrs Parke, Davis & Co., for their provision of delightful entertainment and instructive opportunity in the visit to their works on Thursday.

To the Michigan Yacht Club for throwing open to us their house with words of welcome.

To Mr. John Williamson and Mr. Lightner for the provision of most acceptable gifts, to be distributed to members in attendance.

To the Druggists of St. Clair for the interesting and profitable excursion they tender us.

To the Wholesale Druggists, the Manufacturers, and the Dispensing Parmacists of Detroit, and to Messrs. D. O. Haynes & Co., for the most important provision of contributions of money, to meet the expenses of our entertainment at this meeting.

And we desire furthermore to declare our hearty and unqualified satisfaction with the happy selection of St. Clair Flats as the place of the eleventh meeting.

To our local Secretary, Mr. James Vernor of Detroit, we must express our most hearty thanks for the exceeding service he has rendered the Association in his active attention to the arrangements for the meeting. His well-known business power has been faithfully given without reserve, for our advantage and pleasure, and the extent of his labor should be the large measure of our gratitude.

To Mr. and Mrs. James Slocum, of the Star Island House, for the free use of their halls and for the most hospitable and courteous entertainments.

Sherrard: I move that these resolutions be adopted.

Motion carried.

President: The only business that I know of now is the selection of the time and place of the next meeting. We have a communication from Mr. Peck, chairman of the Committee on Trade Interests, which he wished to be presented. We wanted to hold it for a full meeting. There is nothing left for consideration. It will take about ten minutes to read the report.

REPORT ON TRADE INTERESTS.

To the Michigan Pharmaceutcal Association.

Your Committee on trade interests beg to submit a general review of the conditions of the drug trade in '92 and '93, and will also broaden its efforts in covering other subjects, in hopes that vigorous and free discussion may be brought, both for and against the propositions submitted, thereby enabling us to view all sides of questions affecting our progress and interests, before accepting conclusions that may be modified or changed by the light of discussion.

SECTION I: *The Great Problem, the Cutting Question, Still Confronts Us.*—As a matter of course, the question of how best to regulate the fast growing evil of cutting prices upon proprietary preparations, has absorbed a very large share of attention from the several branches of the drug trade throughout the entire country. A casual glance at the present condition of affairs does not seem to reveal much of an encouraging nature, but a more extended examination into the matter is advisable. About the only plan for attacking the evil has been what has become so well known as the A. P. A. plan. Shortly after our meeting last August the National Druggists' Association and the Association of Manufacturers and Dealers in Proprietary Medicines met in Montreal, and this subject came up for very thorough discussion. The tendency at first was to give but little attention to the matter, but the decided stand taken by the accredited representatives from State pharmaceutical associations, and other bodies representing the retail trade, and the forcible arguments presented by representatives from the Inter-State Retail Druggists' League, rendered it impossible to table the matter. It was therefore very fully considered, with the result of some minor modifications, to make it of a better working nature, and its commitment for enforcement to the Inter-State Retail Druggists' League. The manufacturers and jobbers assured the League of their willingness to do what they could to bring about an abolition of the evil, but saw no way out of the woods save through the very general organization of the retail trade whereby its demands could be enforced. With the details of the plan as finally adopted, you are familiar. The officers of the League went quickly to work, drew up uniform papers for the purpose of organiz-

ing druggists in every locality, and through State executive committeemen these plans were supplied to all associations who expressed a desire for them; but a careful perusal of the pharmaceutical journals during the past year, shows that notwithstanding the extreme efforts of the League, the condition of affairs in some of the most important trade centers is greatly demoralized. While some States and cities have pretty thorough organizations (such as Massachusetts, Nebraska, Kansas (?), Baltimore, Cleveland, Louisville, etc.), the local branches in St. Louis and Chicago, when just upon the eve of the accomplishment of their most ardent desire, went all to pieces through the dissatisfaction of some members who had their own narrow and personal interests closer at heart than the weal of the profession as a whole.

Many States and many localities (Michigan, we regret to say, among them) have shown no desire whatever to co-operate with the League. The League has been sadly hampered through the lack of funds to carry on its work, which funds could come only from retail druggists themselves, or their associations. So far, there has been effected no organization of the retail trade of the country to the extent which is necessary to make the movement a success, and if it fails, it will be due solely to the supineness and lack of interest on the part of retail druggists. Because of this general sleepy condition, the manufacturers are beginning to get uneasy, and are not taking any too great pains to protect the retail trade, which they are finding will not in turn support them, and so far from cutting being on the decrease, it seems to be on the increase. It has also been learned that manufacturers do not object to selling to wholesale grocers; this being an entirely new departure from established customs, tends still further to complicate the question. The jobbers generally (if we may except those of Detroit) supply all demands from parties in good credit, and no question is permitted to arise that interferes with the distribution of merchandise. Hence we cannot but recognize the discouraging outlook. In Detroit two or three cut-rate stores, one of them in connection with a large grocery concern, seem to be flourishing. Other sections of the State report cutting on the increase, and it would seem that if this organization desires to take any action upon this important matter, it must be done at once, and upon such a broad basis that it will bring into union the entire trade of the State; or, on the other hand, we must expect to lose all control of this portion of our business, and sell at prices which will adjust themselves according to the competition we meet.

SECTION II : *Box and Cartage.*— This has been a fruitful subject for discussion in the N. W. D. A. for many years, and there is no uniform rule regulating the charge for these items. They are not billed by the Eastern jobber, they do not appear on invoices of Western houses, and those intermediate between these territories are forced to adapt themselves to either one or the other of these customs as their trade demands. It is quite generally settled, however, that all west of Cleveland charge for box and cartage, while those east do not, though of course, there are exceptions on both sides.

According to the rules of the Lake Erie Wholesale Druggists' Association, these two items must be charged for. Your committee recognize the propriety of a moderate charge for cartage, but protest against the injustice of a continuance of the charge for boxes, it being an established custom that packing cases furnished by the proprietary medicine manufacturers, are free. Three fourths of the cases used by the jobber are received by him from manufacturers of such goods. The original packages containing drugs are also free, and there are but few packing cases that involve any outlay but as above noted, the retailer must pay a schedule price for all packages — a system that is unjust in its operation. Your committee would recommend a vigorous protest against the continuance of such charges.

SECTION III: *The Advance in Price for Quantities of Proprietary Medicines when Purchased in Quantities of Less than One Fourth Dozen.*— The late rule adopted by many manufacturers — at the instance of the jobbers — in enforcing an advance in the prices of many proprietary medicines of 10% in quantities of less than ¼ dozen, is unjust toward the small buyer. Your committee can see no reason why the buyer should be compelled to pay a higher pro-rata price for $\frac{1}{12}$ or $\frac{1}{8}$ dozen, than for any other fraction of a dozen. The effect of this dis-

crimination against the smaller dealer, is to force him either to increase his investment in goods that may be unsalable, or submit to a reduction of his profits, in consequence of this enforced overcharge by the jobber. Your committee believe that this rule is unjust and unpopular with the entire retail trade, and should be abolished. The usual 10% profit to the jobber should be satisfactory.

SECTION IV: *Troy Weight Recommended for Contents of Packages Used for Dispensing.*— The practice of the manufacturing chemists of selling their products in containers holding an avoirdupois ounce or pound, as the case may be, is opposed to the interest of the retailer, especially so with *expensive chemicals put up in ounce containers* and used only for *prescription purposes.* The number of grains in the avoirdupois ounce being 437½, and in the Troy 480, making a loss of over 40 grains which must be taken into account in estimating the cost of the package, but is often overlooked in dispensing, owing to the unnecessary difference in the kind of weights employed in buying the package at wholesale, and dispensing it under a different value at retail. Your committee believe that the same recognized weight should be used by the manufacturer, as prescribed to the pharmacist for dispensing; but cheap chemicals put up in pound packages, used for domestic or manufacturing purposes, should be sold as heretofore by avoirdupois weight.

SECTION V: *Bulk Goods Should Be Furnished for Dispensing Purposes.*— The refusal of manufacturers of preparations in large demand to supply such products in bulk instead of small containers, is worthy of consideration. The greatly increased cost of such preparations involving the time and expense of useless handling, operates against the interests of the dispenser by imposing upon him a tax which is unnecessary, and confers but little profit to the manufacturer, new glassware being so cheap that the accumulated small containers may be considered a nuisance not worth the room they occupy. Hence, manufacturers should be willing to supply their products in bulk, at a price commensurate with quantity.

SECTION VI: *The Extensive and Dishonest Practice of Selling Adulterated Linseed Oil*, will interest a large portion of our members who carry paints and oils in their stock. The practice of mixing cheap oils manufactured for this special purpose, has grown to an extent that will surprise many dealers who imagine the oil sold by them to be genuine linseed. Nearly every wholesale dealer in paints and oils, receives calls from agents selling oils for mixing. This filling (usually of a mineral oil base) is sold at prices varying from 22 to 28 cents per gallon. It has the appearance of true linseed, and may be mixed to the extent of 50% and sold for the genuine article. Several large dealers are engaged in selling the mixture by the barrel at prices averaging from three to five cents below the value of the genuine oil. Notably, a concern in Cleveland has sold a large number of barrels throughout Michigan. Their mode of doing business is not to guarantee the oil to be pure, but prime. As that term has no definite meaning, the purchaser is compelled to pocket his loss with as good grace as his feelings will permit; the word "prime" being used on their postal cards giving quotations for their oil.

Your Committee have ascertained that the adulteration of linseed oil is not altogether confined to the wholesale dealers, but that the practice is spreading among smaller dealers, who thus render the business unprofitable to parties who desire to sell what their customers want; viz., pure linseed oil. This information is given in this report simply for the purpose of explaining why some druggists can sell the article at less price than competing firms pay for honest goods.

SECTION VII: *The Value of One's Own Products.*— The value of the pharmacist of identifying his own name to specialties, instead of purchasing such goods at wholesale, cannot be overestimated. He should manufacture, as far as possible, his own Tooth Powder, Face Preparations, Cosmetics, Lotions, and all the various "incidentals" of this class in constant demand: and to continue multiplying the specialties (to keep abreast of the times) under his own name. The value of proprietary rights in such goods cannot be overestimated, as the trade mark brings customers who are influenced by the merit of such goods,

while the labor and material are productive of greatly increased profit. But the principal value of such domestic preparations lies in the fact that the pharmacist thereby works for himself individually, instead of the manufacturer, who places competing duplicate goods in every store. The druggist's individuality thus finds expression in his merchandise, and he thereby retains the entire benefits arising from his enterprise. The number of articles that is possible for him to manufacture and control is only limited by his skill in presenting them in attractive form to the public, while the ably edited Trade Journals furnish excellent formulas for proceeding on these lines to an almost unlimited extent.

SECTION VIII: *Newspaper Advertising.*— The subject of contracts with proprietors for newspaper advertising, is worthy of our careful attention. It has been observed that this business is left almost wholly in the hands of the advertisers themselves, who use the name of the druggist in a promiscuous manner. He not only pledges the druggist to warrant a cure, but in many instances states that he has personal knowledge of the nostrum he recommends, etc., etc. In some cases he is advertised to give a written warrantee of cures by the use of a certain number of boxes or bottles, to be paid for at one time.

Every pharmacist at times has had to blush at what is printed over his own name, and but few even see the copy before it is handed over to the newspaper. If we expect to secure and retain public confidence, all such newspaper promises made to mislead, should be carefully expurged from all copy before it goes to the printer.

The druggist, under the present custom of permitting almost unlimited license to manufacturers of proprietary medicines in the use of his name for advertising purposes, is inflicting an injury to his standing in his profession. How can he justify himself in claiming the privilege and right of compounding prescriptions from the physician, while openly urging the sale and use of nostrums, even of those in which he has no interest, other than a vender.

SECTION IX: *Supply Houses.*— This is one of the most important questions commanding the attention of the druggist. The rapid growth in numbers of these houses, is a more serious menace than the cut-rate matter, inasmuch as it strikes right to the root of his professional business, where must come into play his professional and technical knowledge. Could not druggists bring themselves the trade of physicians which is being rapidly alienated through the methods of these houses?

SECTION X: *Insurance.*—The insurance of drug stocks in small towns has been discussed at previous sessions of this Association. Statistics prove that the losses resulting from fires are very light, extra care being exercised in consequence of the inflammable character of the merchandise so insured. Your committee claim that the rates of premiums, instead of being from 3% to 5% as at present charged, should be reduced at least 50%, such reduction being only commensurate with risks assumed, the extent of which should be governed by statistics of losses instead of the arbitrary rates now imposed by the underwriters, which are unjust toward the druggist. This complaint does not, so far as your committee can learn, apply to the cities; but the extortion is so great in some of the smaller towns that but a small portion of such stocks can bear the expense of the excessive premiums.

SECTION XI: *Violation of the Pharmacy Law.*— Your committee also desire to call the attention of the Association, and of "The Board of Pharmacy" to what it believes a flagrant violation of the letter, and certainly of the spirit of the law regulating the practice of pharmacy. While it is the right and privilege of physicians personally to compound their own medicines, it is a well-known fact that this privilege is delegated to office boys, and that the common practice in the offices of most physicians who carry their stock of drugs, is to have their prescriptions put up by unregistered assistants. This evil has already acquired a large degree of magnitude in the cities. The busy doctor finds but little time to spend at the prescription desk, hence the office help is called to take the place of the registered pharmacist. The tendency of permitting such violations of the law is to withdraw the legitimate work of the pharmacist to the doctor's office.

Your committee believe that investigation will disclose the fact that the majority of physicians of the cities of this State, who furnish their own supplies,

seldom employ registered pharmacists for this work. The responsibility of obtaining evidence properly lies with the local druggist, but the financial loss and professional alienation would usually deter him from placing himself in an attitude of open hostility to the interests of the physician, hence but few pharmacists could afford to undertake the task of securing evidence in such violations. But the evil tends to encourage the busy practitioner to compound his prescriptions, instead of sending them through the regular channel.

SECTION XII: In conclusion your committee would report that the trading for the past year has been characterized by few noteworthy features. The volume of business is becoming more and more subdivided, and new pharmacies are multiplying in the cities to a degree that seriously menaces the existence of those who are well established. While it is conceded that the field is open for all, still it cannot but be apparent that the encouragement extended by the jobbers who secure their investment by chattel mortgages, bears hard upon the pharmacist who is laboring in the face of already close competition. Under these circumstances the jobber only seeks a new outlet for his supplies, but the evil inflicted on his established customer, is in many instances equivalent to extinguishing his profits.

The establishment of new stores has become a special feature with some wholesale druggists, and to their partial ownership may be found the reason why such a multitude of new pharmacies has recently come into existence.

Your committee believe that the jobbers should discourage new enterprises of this character in neighborhoods already well provided, and refer persons contemplating opening new stores, to pharmacists who desire relinquishing business, thus accommodating both interested parties, instead of placing obstacles in the path of old friends who have given him financial support.

JOHN E. PECK,
Chairman.

President: We have n't time now to enter into any such discussion as this paper deserves. I wish to offer a vote of thanks to Mr. Peck for his paper.

Carried.

Prescott: I move that a vote of thanks be offered our local Secretary, Mr. Vernor.

Motion carried.

President: One other matter — we were all interested in the report on adulterations. The paper this year was more satisfactory than any ever presented before, and I wish to offer, in behalf of this Association, a vote of thanks for that most excellent work.

Motion carried.

Meeting adjourned.

TIME AND PLACE OF NEXT MEETING.— After the banquet, Wednesday evening, June 21, it was moved by Mr. Stevens and carried, that the selection of the time and place of the next meeting and the local Secretary, be left to the Executive Committee and officers of the Association.

FIFTH SESSION.

JUNE 22, 1893, 8:30 A. M.

Mr. Stevens acting as Chairman.

CHAIRMAN: Shall we proceed with the trade report, or take up something else first?

Bassett: The Secretary might pick out each portion and give us the gist of it.

Secretary: If I attempted to read the full report, it would take up all our time.

Chairman: Just give us the first point.

Secretary reads Section I.

(See page 53.)

Chairman: You have heard this portion, what is your pleasure?

Bassett: I move that it be adopted.

Motion carried.

Secretary: The next portion refers to boxing and cartage.

(Section II, see page 54.)

Parkill: He states, I think, that a limited amount for cartage is all right. You never get a case or box free. We are charged for each box. I move that we endorse that section.

Bassett: I don't think there is so much injustice after all. Drugs are sold close at the present time, and the price is put down wherever possible. If you put in a fair charge for boxing and cartage, you make up for it somewhere else.

Secretary: Perhaps some of you don't just understand the position. The charge for boxing and cartage was universal up to a few years ago. At that time, one or two houses in the East abolished the charge, and others soon followed suit, since when the question has been one very thoroughly discussed at the meetings of the wholesalers. It will undoubtedly come up in a stronger way at their meeting in September, and it is said that, if one or two New York houses can be brought into line, the charge will again be universal throughout the United States. At present, the charge is not made east of Pittsburgh, is universal west of Mississippi, and in this section, it is generally made, though there are numbers of exceptions.

Chairman: Any further discussion?

Secretary: It seems to me, if any action be taken, it should be a general one to express the sentiment of the Association; that the matter be definitely settled to charge, or not to charge.

Bassett: I want to offer a motion amending Mr. Parsons' suggestion, that wholesalers charge only for new boxes.

Chairman: Any further remarks?

It is moved that wholesale houses be requested not to charge for boxes, except new ones.

Motion carried.

Secretary reads Section III. (See page 54.)

Eberbach: I am not willing to sell a single bottle at the same rate as I would six, and I think, if we do so, the wholesaler ought to be put on the same basis. Small sales take time and "time is money." I think that that part is an injustice to the dealer.

Gundrum: I was surprised when that part was read yesterday, that Mr. Peck should advocate such a thing. I don't think that it is right to sell one twelfth or one sixth of a dozen at

the same rate as a dozen cases, and I would move that that part of it be laid on the table.

Parkill: There is one idea in connection with this which has not been carried out. I mean new remedies. Wholesalers make the manufacturer stand behind them, and if retailers would take the same stand, we would not be loading up with one twelfth and one sixth of a dozen of everything.

Chairman: It is moved that this portion of the report be laid on the table.

Motion carried.

Secretary: The next portion of the report for discussion is Troy weight for contents of boxes.

(Section IV, see page 55.)

Eberbach: I don't exactly see the point of that. If a man gives 480 grains instead of 437.5, he pays the penalty, and I think that every pharmacist will look out for number one.

Gundrum: There is a difference of 42.5 grains between the two weights, and if a man is n't capable of discriminating, I don't think we ought to be expected to be interested in holding a meeting for such a man. I move that that portion be laid on the table.

Motion carried.

Secretary reads Section V. (See page 55.)

Chairman: What shall be done with this portion?

Bassett: I move to indorse that portion of the recommendation.

Motion carried.

Secretary: The next portion is in regard to advertising. There is no recommendation, but there is some good advice given that the druggist should be careful in allowing the use of his name.

(Section VIII, see page 56.)

Parkill: There is one thing almost directly in this line, which we should pay attention to. A man wants to introduce some new remedy. He tells a story about its wonderful effects, and if you take so much of his medicine, you get free advertising for a whole year. If you pay him $30 for the remedy, it pays for everything. Every week the retailer has such a proposition presented to him. We are paying for having a lot of stuff introduced.

Prescott: I hope that this portion will be adopted very heartily. It is something that I have noticed for a good many years. Pharmacists sell such remedies as are called for, but it is a very common thing to see in front, a sign giving recommendations of these remedies which never originated with them. Such a pharmacist recommends so and so, and it will cure so and so, is a common thing.

Gundrum: I wish we could devise some means by which we could stop this thing. I have had some experience myself, and it makes the cold sweat come out all over me, when I think of it. We can't run when we see those fellows coming.

Whitmarsh: I would like to make a motion, actual and effective, to go on record. I take the side of the druggist in this matter, because it is a point between him and an outsider, and I would suggest that the latter be killed on the spot. I am in favor of taking some action and letting him know what we think of it.

Prescott: I move that this section (VIII) be adopted.

Motion carried.

Secretary reads Section X. (See page 56.)

Whitmarsh: I was carrying insurance at one time at 2%. An agent came along and said, "I will have to put you up ¼. I let him do it. The next year he said, "I guess I'll have to put you up another ¼ all round." I asked him why, and the only answer he would vouchsafe was "Board rates." He gave no reason. Before he came around the next year, I took insurance with another party — 2% all round. He wanted to know whom I had given it to, and said he didn't care much about it himself. I think we ought to stand up for our rights, and I endorse that portion.

Bassett: I don't like to disagree with the gentleman, but I take the opposite side. I had a conversation with some of the principal insurance agents in our town a short time ago, and I assure you that the insurance companies have not made a great deal of money in the last few years. They were about to combine into a board. I think that druggists get a board rate. I think that trade has a right to combine and protect itself. I don't think that they are very unjust. I approve of the principle of a board rate, and I wish we could get a board to protect ourselves.

Dupont: Mr. Peck seems to think that a board rate of 5% is too high. We pay 5%. That is the usual rate in the country.

Secretary: That refers principally to small towns where the rate is from 3% to 5%. It should be reduced 50%.

Bassett: I don't see how it is that in some places, insurance companies will give any rate at all.

Gundrum: I had a brother occupying a wooden building in a small town. The rate was 5%. He would n't insure because he thought the rate was too high. He did n't insure. On the other hand, I paid $1.10 on $100.00. I understand that in ordinary business, they get insurance for $1.00. The extra 10% is for a drug-store. I don't think that that rate is extraordinary.

Chairman: Any further remarks? No motion made in regard to this.

Secretary reads Section XI. (See page 56.)

Bassett: I move that the State Board be instructed to look into this matter.

Motion carried.

Chairman: The State Board stands ready to do anything.

Gundrum: I would state here, for the information of those who may not know, that if we get information from any one,

we must have his signature, but we do not report the name of the informer.

Chairman: Yes, I think that point ought to be understood. I don't think that it is generally understood.

Secretary: The concluding portion of the report is of a somewhat general character.

Secretary reads Section XII. (See page 57.)

Moved and carried that this part be adopted.

Dupont: I hope to see the day when supply houses will be dispensed with.

Whitmarsh: Regarding the office boy putting up prescriptions, it struck me as a good idea that there should be some way of determining whether it was regularly compounded or put up. If only the initial of the physician be put on, it is all right.

Chairman: This might be considered in the future.

Gundrum: I move that we adjourn *sine die*.

ENTERTAINMENTS.

THE amusement features of this meeting were most enjoyable, being much augmented by a delightful, cool, lake breeze. Tuesday morning the party took a short sail on a steam yacht, and while the ladies were given a chance at angling, the men remained on board to listen to Prof. Prescott read valuable papers contributed by the graduating class. The same evening a hop was given, and the dancing was enjoyed by all, including a yachting party of forty or fifty persons from Mt. Clemens. On Wednesday a trip to the Oakland, St. Clair, was given, and upon arrival a group photograph was taken, after which a fine dinner was enjoyed. Then the party was conducted on board a steamer, and under the guidance of the St. Clair druggists, visited the salt industries of their city, returning to the Star Island house in the early evening. In the evening a tasty banquet was participated in by about one hundred and fifty people, who listened later to this program of toasts, under direction of Toastmaster Jas. Vernor: "Alumni Association," Geo. Wagner, Ann Arbor; The Country Druggist," S. P. Whitmarsh, Palmyra; "What I Do n't Know," C. C. Sherrard, Detroit; "Doctor and Druggist," Geo. J. Ward, St. Clair; "Our Association," S. E. Parkill, Owosso; and a few miscellaneous fragments from A. B. Stevens, A. Bassett, C. W. Parsons, and others.

Thursday morning, several rowing and other contests took place, ladies as well as the gentlemen taking part, prizes being supplied by F. F. Ingram & Co., E. R. Lightner & Co., Williamson Manufacturing Co., and other houses, to reward the victors. After this the party enjoyed the return sail to Detroit, and by special invitation they stopped at Parke, Davis & Co's., laboratory, and were welcomed by music from the fine band of the house. After being escorted through the mammoth establishment, a tasty and appetizing lunch was served and enjoyed,

during an instrumental concert. Leaving here, the Belle Isle Park wagons gathered in the crowd, carried them over the island's beautiful drives, stopping for inspection of the Michigan Yacht Club's elegant house, and to enjoy their hospitality, thence returning to the ferry dock to allow the party to return to the city. Everyone was more than pleased with the amuse ments, and in parting said, "Good-bye for one year only," promising to be at the next meeting.

ANNUAL MEETING OF THE ALUMNI ASSOCIATION.

DEPARTMENT OF PHARMACY, UNIVERSITY OF MICHIGAN,
HELD AT ST. CLAIR FLATS, JUNE 20, 1893.

MEETING was called to order by President J. O. Schlotterbeck on Wedensday, June 20, at 1:40, P. M., at Star Island House, and after roll-call by classes, approving of the minutes of the previous meeting, reading and accepting of the treasurer's report, an address was delivered by the President. Following this address others were made by Prof. Stevens, Prof. Prescott, Mr. Parkill, and the President.

On motion of Prof. Stevens, "upon signing the Constitution and By-Laws of this Association," was ordered stricken out of Act II. The following was offered as a substitute for first paragraph of Art. IV, the second remaining the same; viz., "A meeting of the Association shall be called at such time and place as shall be deemed advisable by the officers of the Association."

Article V was made to read as follows:—

"This Constitution may be amended by a two-thirds vote of all the members present at a meeting of the Association."

Various amendments were also made to By-Laws.

Officers were chosen as follows:—

President, C. C. Sherrard, '90.

First Vice-President, F. H. Nickerson, '93.

Second Vice-President, Miss L. M. Geddes, '93.

Third Vice President, C. G. Stone, '77.

Recording Secretary, L. J. Spenker, '89.

Corresponding Secretary and Treasurer, W. G. Palmer, '90. Ann Arbor, Mich.

After extending a vote of thanks to the Michigan State Pharmaceutical Association and to the retiring officers, the meeting adjourned.

In Memoriam.

Carrie D. Keutz	Carleton.
R. Bruske	East Saginaw.
Wm. J. Smythe	St. Louis, Mo.
George Boehnlein	Detroit.

CONSTITUTION AND BY-LAWS.

ADOPTED AT PETOSKEY, MICHIGAN, JULY 13TH, 1887.

PREAMBLE.

WHEREAS, Organization, concert of action, and comparison of ideas are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore,—

Resolved, That we, druggists of the State of Michigan, whose names are hereunto attached, in compliance with an act entitled, An Act to Organize the Reputable Pharmacists of the State of Michigan into an Association, to be known as the Michigan Pharmaceutical Association, approved April, 1887, do hereby organize ourselves into such Association, and adopt the following Constitution and By-laws: —

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The object of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard, and ultimately to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.— MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry, and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.— OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected by ballot at the third sitting of the regular annual meeting of the Association, and to serve until their successors are elected.

ARTICLE V.— DUTIES OF OFFICERS.

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order shall preside at all meetings of the Association, until the close of such meetings; call special meetings at the written request of twenty-five members; fill all vacancies that may occur in the offices of the Association between the annual meetings; shall present at each meeting a report of the Association, and perform such other duties as pertain to the office.

SEC. 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction

with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election, and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all moneys for dues, and from all other sources, giving receipts for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee. He shall file a copy of the proceedings of each annual meeting in the office of the State Board of Health, and the Secretary of State, and shall keep at least three copies in his own office.

SEC. 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

SEC. 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without necessary delay, all papers and property of the Association committed to their care.

SEC. 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.— MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.— BY-LAWS.

This Association may establish for its future government and regulation, such By-laws, not in conflict with the Constitution, as may be deemed proper and desirable.

ARTICLE VIII.— AMENDMENTS.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.— QUORUM.

Twelve members shall constitute a quorum.

ARTICLE II.— MEMBERSHIP.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented in writing, signed by two members in good standing, to the Executive Committee, and if favorably acted upon by that committee, the candidate shall be considered elected. A vote of all the members of the Executive Committee shall be required for an election.

ARTICLE III.— FEES.

The initiation fee of this Association shall be one dollar, which fee shall accompany the application.

ARTICLE IV.— DUES.

[As Amended Aug. 4, 1892, at Grand Rapids Meeting.]

Every member shall pay to the Secretary on or before the first day of January of each year the sum of one dollar. Any member in arrears shall not be entitled to vote. It shall be the duty of the secretary to draw on all members when two years in arrears, previously sending notice of his intention to draw at a certain date. Any person neglecting to pay dues for three successive years shall forfeit membership. Dues paid by new members before an annual meeting shall apply on the present year. Those becoming members and paying dues after an annual meeting shall receive credit for the following year.

ARTICLE V.— CERTIFICATE OF MEMBERSHIP.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.— COMMITTEES.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be an ex-officio member) each to consist of three members; viz., Committee on Trade Interests; Committee on Pharmacy and Queries; Committee on Legislation; Committee on Adulterations.

SEC. 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.

SEC. 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions of investigation as may be practicable, to be reported upon at the next annual meeting.

SEC. 4. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.— SUSPENSIONS — AMENDMENTS.

SECTION 1. These By-laws shall not be suspended without the consent of two-thirds of the members present.

SEC. 2. Any amendment to these By-laws must be made in writing and read before the Association at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two thirds of the members present, it shall become a part of these By-laws.

ARTICLE VIII.— DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meeting of the American Pharmaceutical Association.

ARTICLE IX.— PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees, and members, shall be published annually under the supervision of an editor, who shall be

elected annually, and who shall be paid from the funds of the Association, and a copy of the proceedings shall be sent to each member of the Association less than two years in arrears.

ARTICLE X.—EXPULSION OF MEMBERS.

Any member or officer accused of violating the Constitution or By-laws, or other improper conduct, may be expelled or removed from office by a two-thirds vote of all the members present at a regular meeting. In every case definite charges must be preferred in writing, to which shall be affixed the names of not less than three members of the Association, and the Secretary shall send the accused person a copy of the charges, and notify him in writing, at least two weeks in advance of the time when his case will come up for hearing, offering him an opportunity to be heard in his own defense.

ARTICLE XI.—EXHIBITS.

The Association invites manufacturers and others to exhibit at the annual meetings, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.—RULES OF ORDER—ORDER OF BUSINESS.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SEC. 2. The order of business shall be such as the Executive Committee shall prescribe.

THE PHARMACY LAW.

AN ACT

To regulate the practice of Pharmacy in the State of Michigan.

(ACT NO. 134, LAWS OF 1885.)

SECTION 1. *The People of the State of Michigan enact*, That the Governor, with the advice and consent of the Senate, shall, within thirty days after the passage of this act, appoint five persons and annually thereafter one person from among such competent pharmacists in the State as have had ten years' practical experience in dispensing physicians' prescriptions, who shall constitute the Michigan Board of Pharmacy. The term of office of said five persons shall be so arranged that the term of one shall expire on the thirty-first day of December of each year, and all appointments made thereafter shall be for the term of five years.

SEC. 2. The said Board shall, within thirty days after its appointment, meet, and organize by election of a pres dent and secretary, from its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the board. It shall be the duty of the board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to investigate complaints and to cause the prosecution of all persons violating its provisions; to report annually to the Governor, and to the Michigan Pharmaceutical Association upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said board for the year, and also the names of all pharmacists duly registered under this act; the board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties, at least once in four months, said meetings to be held on the first Tuesdays of March, July, and November in each year; shall make By-laws for the proper fulfillment

of its duties under this act, and shall keep a book of registration in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. The records of said board, or a copy of any part thereof, certified by the Secretary to be a true copy, attested by the seal of the board, shall be accepted as competent evidence in all courts of the State. Three members of said board shall constitute a quorum.

SEC. 3. The Secretary of the board and the Treasurer thereof, if such separate office be created, shall receive a salary which shall be fixed by the board; they shall also receive the amount of their traveling and other expenses incurred in the performance of their official duties. The other members shall receive the sum of three dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in the performance of their official duties. Said salaries, per diem, and expenses, shall be paid from the fees received under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be paid into the State treasury at the end of each year, and so much thereof as shall be necessary to meet the current expenses of said board, shall be subject to the order thereof, if, in any year, the receipts of said board shall not be equal to its expenses. The board shall make an annual report and render an account to the Board of State Auditors, and to the Michigan Pharmaceutical Association, of all moneys received and disbursed by it pursuant to this act.

SEC. 4. Every person who shall, within three months after this act takes effect, forward the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State at the time this act takes effect, in the preparation of physicians' prescriptions, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist: *Provided*, That in case of failure or neglect to register as herein provided, then such person shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy hereinafter described.

SEC. 5. No person other than a licentiate in pharmacy shall be entitled to registration as a pharmacist, except as provided in Section Four. Licentiates in pharmacy shall be such persons, not less than eighteen years of age, who shall have passed a satisfactory examination touching their competency before the Board of Pharmacy. Every such person shall, before an examination is granted, furnish satisfactory evidence that he is of temperate habits, and pay to the board a fee of three dollars: *Provided*, That in case of a failure of any applicant to pass a satisfactory examination, the money shall be held to his credit for second examination at any time within one year. The said board may grant certificates of registration without further examination to the licentiates of such other boards of pharmacy as it may deem proper, upon a payment of a fee of two dollars.

SEC. 6. The said board may grant, under such rules and regulations as it may deem proper, at a fee not exceeding one dollar, the certificate of registered assistant to clerks or assistants in pharmacy not less than eighteen years of age, who at the time this act takes effect shall be engaged in such service in this State, and have been employed or engaged two years or more in the practice of pharmacy, but such certificate shall not entitle the holder to engage in such business on his own account, or to take charge of or act as manager of a pharmacy or drug store.

SEC. 7. Each registered pharmacist, or registered assistant, who desires to continue the practice of his profession shall annually, after the expiration of the first year of his registration, during the time he shall continue in such practice, on such date as the Board of Pharmacy may determine, pay to the said board a registration fee to be fixed by the board, but which shall not exceed one dollar for a pharmacist, or fifty cents for an assistant, for which he shall receive a renewal of said registration. Every person receiving a certificate under this act

shall keep the same conspicuously exposed in his place of business. Every registered pharmacist, or assistant, shall, within ten days after changing his place of business or employment, as designated by his certificate, notify the secretary of the board of his new place of business. If any pharmacist or registered assistant shall fail or neglect to procure his annual registration, or to comply with the other provisions of this section, his right to act as such pharmacist or assistant shall cease at the expiration of ten days from the time notice of such failure to comply with the provisions of this section shall have been mailed to him by the secretary of said board.

SEC. 8. All or any registration obtained through false representations shall be void, and the Board of Pharmacy may hear complaints and evidence, and may revoke such certificates as it may deem improperly held.

SEC. 9. Any proprietor of a pharmacy who, not being a registered pharmacist, shall, ninety days after this act takes effect, fail or neglect to place in charge of such pharmacy, a registered pharmacist, or any such proprietor who shall by himself, or any other person, permit the compounding or dispensing of prescriptions, or the vending of drugs, medicines, or poisons, in his store or place of business, except by or in the presence and under the supervision of a registered pharmacist, or except by a registered assistant; or any person not being a registered pharmacist who shall take charge of or act as manager of such pharmacy or store, or who, not being a registered pharmacist or registered assistant, shall retail, compound, or dispense drugs, medicines, or poisons, or any person violating any other provision of this act to which no other penalty is herein attached, shall be deemed guilty of a misdemeanor, and for every such offense, upon conviction thereof, shall be punished by a fine of not less than ten nor more than one hundred dollars, and in default of payment thereof, shall be imprisoned not less than ten days nor more than ninety days, or both, such fine and imprisonment in the discretion of the court.

SEC. 10. Nothing in this act shall apply to, or in any manner interfere with, the business of any practicing physician who does not keep open shop for retailing, dispensing, or compounding of medicine and poison, or prevent him from supplying to his patient such articles as may seem to him proper, nor with the vending of patent or proprietary medicines by any retail dealer *who has been in such business three years or more*, nor with the selling by any person of drugs, medicines, chemicals, essential oils, and tinctures, which are put up in bottles, boxes, packages, bearing labels securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons three months, six months, one year, three years, five years, ten years, fifteen years, and twenty-one years of age, and if a poison, the name or names of the most common antidotes; of copperas, borax, blue vitriol, saltpetre, pepper, sulphur, brimstone, paris green, liquorice, sage, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerine, Glauber salts, Epsom salts, cream tartar, bi-carbonate of soda, sugar of lead, and such acids as are used in coloring and tanning, nor with the selling of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, laudanum, quinine, and all other preparations of cinchona bark, tincture of aconite, and tincture of iron, compound cathartic pills, or quinine pills, nor with the exclusively wholesale business of any dealer; *Provided*, that every person who shall within three months after this act takes effect forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State, in the preparation of physician's prescriptions, three years next previous to the second day of June, 1885, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the certificate of a registered pharmacist. *And provided further*, That the said board may grant, at a fee not exceeding one dollar, to such person not less than sixteen years of age who shall pass a satisfactory examination touching his competency before the Board of Pharmacy, the certificate of registered "assistant," but such certificate shall not entitle the

holder to engage in business on his own account or to take charge of or act as manager of a pharmacy or drug store.

SEC. 11. No person shall add to or remove from any drug, medicine, chemical, pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value, or medicinal effect, or which shall alter the nature or composition of such drug, medicine, chemical, or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or purity. Any person who shall thus willfully adulterate or alter, or cause to be adulterated or altered, or shall sell or offer for sale, any such drugs, medicine, chemical, or pharmaceutical preparation, or any person who shall substitute, or cause to be substituted, one material for another, with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. If convicted, he shall be liable to all the costs of the action, and for the first offense be liable to a fine of not less than ten dollars nor more than one hundred dollars, and for each subsequent offense a fine of not less than twenty-five dollars nor more than one hundred and fifty dollars. On complaint being entered, the Board of Pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulteration, substitution, or alteration, and report upon the result of his investigation; and if said report shall be deemed to justify such action, the board shall duly cause the prosecution of the offender, as provided in this act.

SEC. 12. The senior pharmacist of every house dispensing and compounding medicines, registered under this act, shall be exempt and free from all jury duty in the courts of this State.

SEC. 13. All acts and parts of acts in conflict with the provision of this act are hereby repealed.

Approved June 2, 1885.

NOTE.—Section 10 in this Act is the Amended Section, entitled an "Act to Amend Sec. 10," etc. Approved June 18, 1887.

ROLL OF MEMBERS.

M. S. P. A.

Adams, H. M., Port Huron 1888
Aisenman, Wolf A., Oklahoma City, O. T. 1891
Akey, J. V., 114 S. Spring St., Los Angeles, Cal. 1885
Allen, A. W., 410 Grand River Ave., Detroit 1883
Allen, Chalmers P., West Bay City .. 1891
Allen, Harris Edson, Morenci 1892
Amberg, Isaac, Battle Creek 1886
Anderson, C. N., 96 Woodward Ave., Detroit 1888
Anderson, Edwin S., 159 Jefferson Ave., Detroit 1888
Anderson, Ellery, Midland 1884
Anderson, Moxson, Midland 1884
Andrus, E. J., Utica 1886
Armstrong, R. S., Chelsea 1888
Arthur, Hiram, Dowagiac 1887
Atchinson, F. E., Gladwin 1888
Babbington, John, Corunna 1884
Bachman, M. H., Stanton 1883
Bailey, Dr. John R., Mackinac Island 1890
Bailey, M. G., Mackinac Island 1888
Baker, H. G., Nelson, Baker & Co., Detroit 1888
Ballard, Edwin, Saginaw, W. S. 1890
Bangs, W. Z., Grand Rapids 1885
Banister, George E., Utica 1889
Bannister, John L., 201 S. Washington St., Saginaw, E. S. 1890
Barber, M. A., Petoskey 1887
Barie, H. L., 435 Macomb St., Detroit. 1887
Barnard, Wm. Dwight, Manistee 1891
Barrows, J. F., Lawrence 1885
Bassett, A., 96 Woodward Ave., Detroit 1884
Bassett, A. J., Ypsilanti 1885
Bauer, A. C., Detroit 1884
Beach, L. F., Bay City 1884
Beachman, C. B., Romeo 1884
Beckwith, R. G., Bradley 1888
Beeden, Bert N., Williams, Davis, Brooks & Co., Detroit 1889
Bell, Jno., Lexington 1888
Belsher, W. E., East Saginaw 1884
Berridge, Chas. S., Orion, Oakland Co. 1890
Bertram, J. P., Westphalia 1883
Bigelow, W. H., Owosso 1884
Blackmer, H. A., Charlotte 1884
Blair, C. A., Morenci 1885
Blakeslee, L. G., Detroit 1885
Bliss, Lyman W., Saginaw 1890
Boden, Edwin T., West Bay City 1890
Bogart, Frank A., Detroit 1890
Borradaile, F. H., 41 Michigan Ave., Detroit 1892
Bostick, Chas. H., Manton 1892
Bostick, J. C., Manton 1887
Botsford, E. S., Dorr 1886
Bower, J. E., Crystal Falls 1887
Bower, Reuben T., Jr. Petoskey 1891
Boynton, Oliver C., Port Huron 1890
Brackett, F. E., Cheboygan 1887
Breitenbach, A. P., 99 Elizabeth St., Detroit 1889
Bricker, C. E., Port Huron 1888
Briggs, J. W., Schoolcraft 1883
Bristol, F. E., Lapeer 1884
Bristol, N. D., Lapeer 1884
Brooks, Alanson S., Detroit 1890
Bross, C. M., Jerome 1889
Brown, D. D., Kalamazoo 1885
Brown, H. J., Ann Arbor 1883
Brown, J. J., Okemos 1883
Brown, W. J., Marquette 1888
Brundage, F., Muskegon 1886
Buchanan, B. F., Harrisville 1883
Buchanan, B. S., Detroit 1888
Buckham, B. J., Flint 1890
Bugbee, C. A., Cheboygan 1885
Burdick, H. H., West Bay City 1884
Burley, David H., 111 Huron Ave., Port Huron 1890
Burroughs, C. S., Clinton 1884
Burwell, R. G., Fort Gratiot 1884
Cady, G. F., Hart 1883
Cagwin, Joel E., 11 S. Story St., Boone, Ia. 1896
Caldwell, J. W., 242 Grand River Ave., Detroit 1888
Calkins, E. E., Ann Arbor 1884
Calkins, S. B., Charlevoix 1885
Campbell, J. E., 477 Grand River Ave., Detroit 1888
Carney, M. S., Decatur 1885
Caulkins, F. D., Bay City 1888
Chamberlin, G. T., Hartford 1883
Chandler, C. A., Cambria 1884
Church, H. M. Holly 1884
Church, Wm. D., Parke, Davis & Co., Detroit 1889
Clark, A. B., Gobleville 1889
Clark, A. G., White Cloud 1883
Clark, H. C., Detroit 1888
Clark, J. K., Blissfield 1884
Clark, S. B., Flint 1890
Claxton, W. C., Calgany Alberto, N. W. T., Canada 1885
Coe, T. D., Romeo 1884
Cohoe, Adolph, Capac 1890
Coleman, G. E., Elk Rapids 1885
Coleman, H. G., Kalamazoo 1884
Coleman, Sheldon E., Kalamazoo 1898
Collins, Jno. B., Frankfort 1888
Colwell, Dr. C. B., Jackson 1886
Conrad, J. F., Otsego 1886
Conway, V. R., Sault Ste. Marie 1885
Cook, C. E., 912 Van Buren St., Bay City 1884
Cooper, I. S., Cheboygan 1885
Cornell, Aaron, Elkton 1890
Cornell, David A., Copemish 1892
Cosford, J. W., Mancelona 1887
Craft, C. V., Flint 1890
Crawford, J. B., Ithaca 1885
Cress, Edward A., Minden City 1890
Crispe, John, Plainwell 1886
Crouter, G. W., Charlevoix 1883
Crowley, J. J., 421 Michigan Ave., Detroit 1884
Culver, Dr. R. W., South Haven 1886
Cummer, R. J., 1116 Payne Ave., Cleveland, Ohio 1884
Cunningham, A. R., 264 Jos. Campau Ave., Detroit 1891
Curran, E. S., St. Joseph 1883
Currie, A. A., St. Clair 1885
Curtis, C. A., Petoskey 1885
Curtis, W. H., Saginaw 1890
Cushman, H. D., Three Rivers 1884
Cutler, W. R., Ionia 1883
Damon, J. A., Millington 1888
Darling, G. S., Tawas City 1888
Davis, F. C., Sand Beach 1888
Davis, George S., Detroit 1884
Davis, Jas. E., Detroit 1884
Davis, T. W., 306 Woodward Ave., Detroit 1888

Dayton, A. J., 674 Wealthy Ave., Grand Rapids 1887
Dean, H. M., Niles 1887
De Forest, George G., 374 Woodward Ave, Detroit 1890
Dendel, W. H., Hopkins Station 1892
Dennis, G. C., Rochester 1888
De Puy, C. E., Stockbridge 1888
Dewey, C. C., Napoleon 1885
Dewitt, P. A., Spring Lake 1888
Dillon, Jas. E., East Tawas 1887
Dodd, I. LeRoy H., Buchanan 1884
Dolsen, Henry, 200 North Hamilton St., Saginaw 1890
Dorman, Charles, Elkton 1890
Dorr, F. W., Detroit 1888
Dorrance, A. A., Coldwater 1883
Dullam, Frank, Flint 1890
Dullam, John C., Flint 1890
Dunlap, Thomas, South Lyon 1884
Dunlop, J. W., Clare 1883
Dupont, William, 183 Michigan Ave., Detroit 1883
Eberbach, O., Ann Arbor 1883
Eberbach, Wm. F., Ann Arbor 1889
Eckerman, A., Muskegon 1884
Eldred, B. C., Chesaning 1885
Elfbrandt, Henry, Negaunee 1890
Elliot, R. H., Pontiac 1885
Empey, M. C., South Bay City 1884
Erwin, M. J., Harbor Springs 1887
Fairchild, H. B., Grand Rapids 1886
Fanckboner, Orin A., 429 East Bridge St., Grand Rapids 1890
Farrand, J. S., Jr., Detroit 1888
Fay, O. J. Carlton 1888
Fellows, C. A., Three Rivers 1884
Fenton, A. W., Bailey 1886
Fenton, George L., Kingsley 1885
Fildew, A. S., St. Johns 1884
Fincher, F. W., Pentwater 1883
Fisher, James, Marlette 1887
Fisk, C. A. E., Petoskey 1885
Foote, C. E., Jackson 1886
Fordham, M., Elmira 1885
Fordham, W. W., Elmira 1884
Forsyth, Edward L., Kalamazoo 1891
Foster, Albert, Benton Harbor 1890
Fox, J. R., Cedar Springs 1886
French, C. S., Hillsdale 1888
Frenzel, G. S. Mayville 1889
Fritz, T. H., Cass City 1885
Fuller, Fred R., Newberry 1890
Fuqua, C. B., Big Rapids 1891
Furniss, John C., Nashville 1891
Garner, Edward J., Canby, Emmet Co. 1891
Gates, Dr. T. O., East Tawas 1884
Gerow, J. E., Ovid 1888
Gidday, Fred'k C., Farrand, Williams & Clark, Detroit 1892
Gill, W. J., Beacon 1884
Gladding, B. O., Constantine 1888
Gladwin, H. L., Merrill 1888
Glazier, F. P., Chelsea 1885
Gleason, E. G., Richmond 1884
Goldsmith, G. S., Manistee 1885
Goodrich, L. A., Hillsdale 1884
Goodrich, L. C., Kalkaska 1883
Gould, Otis, Henderson 1888
Graham, A. B., Detroit 1893
Grandy, Francis, Fairfield 1885
Greenthal, Julius, 986 Michigan Ave., Detroit 1888
Griffith, W. F., Ionia 1883
Grossman, Wm., 1218 Court St., Saginaw, W. S 1890
Grunow, O. H., 182 Gratiot Ave., Detroit 1884
Gundrum, George, Ionia 1883
Hackett, P. E., Wolverine 1886
Hacussler, G. J., Manchester 1885
Hagerman, F., Birmingham 1886
Haight, A. L., Woodland 1886
Haines, Edwin J., Sandusky, Ohio 1890
Hale, H. G., Nashville 1883
Hall, George C., Kalamazoo 1886
Hall, W. A. Greenville 1884
Hamilton, E. A., White Pigeon 1886
Hamilton, Jerome D., M. D., PawPaw. 1892
Harper, J. C., Milan 1884
Hart, Austin P., Mulliken 1891
Harwood, G. M., Petoskey 1884
Harwood, Henry, Ishpeming 1885
Hawkins, A. H., Clayton 1888
Haynes, D. O., 835 Jefferson Ave., Detroit 1886
Heesler, Will, 17 W. Bridge St., Grand Rapids 1883
Heysett, Wm., Ludington 1885
Hicks, C. F., Pontiac 1891
Hicks, Chas. V., Oscoda 1891
Hicks, W. H., Morley 1883
Hinchman, C. C., 76 Jefferson Ave., Detroit 1885
Hinchman, J. M., 76 Jefferson Ave., Detroit 1886
Hinchman, Theo. H., 76 Jefferson Ave., Detroit 1886
Hisner, H. C., Jefferson Ave., and Third St., Detroit 1886
Hodges, F. A., Parma 1888
Holland, Marion, M. D., Edwardsburg 1890
Holton, Samuel M., Battle Creek 1890
Hopkins, F. S., Benton Harbor 1888
Hopkins, I. F., Muskegon 1884
Hubert, John H., Saginaw, E. S 1890
Hueston, G. C., Northville 1885
Hull, C. W., Bay City 1887
Humburg, Fred, 934 Gratiot Ave., Detriot 1886
Hunt, A. O., St. Johns 1885
Hunt, DeWitt H., St. Johns 1888
Hurd, A. E., Davison Station 1884
Hutchins, Lee M., Detroit 1890
Hutchinson, Barzilla S., Lyons 1892
Hutton, R. J., 425 Antoine St., Detroit 1885
Huyck, E. E., Clio 1888
Hyde, A. O., Marshall 1883
Hynes, Quincy, Delton 1885
Inglis, Frank, Detroit 1883
Ingram, E. J., Iron Mountain 1883
Ingram, F. F., Detroit 1891
Jack, G. T., Detroit 1890
Jackman, W. F., 287 Michigan Ave., Detroit 1886
Jacobs, Henry, Jr., Constantine 1890
Jebb, Edward R., Climax 1889
Jesson, Jacob, Muskegon 1886
Jones, Frank E., 453 S. 5th St., Saginaw 1890
Jones, M. A., Marquette 1886
Jones, Shelby B., Greenville 1890
Johnson, J. G., Traverse City 1884
Johnson, O. C., Ann Arbor 1884
Johnson, Sterry A., Ogden Center 1890
Johnson, William C., 120 W. Congress St., Detroit 1886
Judson, F. E., Brighton 1883
Kelly, F. H., Au Sable 1884
Kemink, Theo., 81 W. Leonard, Grand Rapids 1884
Kennedy, E. J., 99 Woodward Ave., Detroit 1884
Kennedy, T. B., Commerce 1886
Kenyon, W. W., Howell 1884
Kephart, H., Berrien Springs 1883
Kephart, W., Berrien Springs 1884
Kestell, J. R., Detroit 1887
Kimball, J. L. Crystal Falls 1884
Kinmont, B. F., Tekonsha 1884
Kinsley, John, Manistee 1889

Kirby, Clarence D., Leslie..... 1890
Kirkwood, P. B., Negaunee..... 1885
Klingman, Theo., Dexter..... 1885
Knill, H. C., Jr., Port Huron..... 1888
Koon, C. S., Muskegon..... 1885
Lacroix, Jos. J., Bay City..... 1890
Lambert, B. L., East Larned & Bates Sts., Detroit..... 1884
Lane, I. D., Sand Beach..... 1884
Langeman, Fred E., Saginaw, W. S.. 1890
LaRue, C. M., West Bay City..... 1885
Latimer, F. N., Ludington..... 1883
Laubengayer, T. A., Owosso..... 1884
Law, Dr. W. J., Leroy..... 1889
Leland, N. P., 430 West King St., Owosso..... 1886
Lentz, Theo., Campbell Ave. and River St., Detroit..... 1885
Lever, Henry, Newaygo..... 1884
Leyerer, George S. Bay City..... 1890
L'Hommedieu, F. C., 95 Woodward Ave., Detroit..... 1888
Litchfield, E. C., Flint..... 1885
Little, A. F., Aarwood, Kalkaska Co. 1885
Lonsbury, Abram D., Midland City.. 1890
Lonsbury, P. M., Reed City..... 1885
Lowman, Dr. Oscar, East Larned and Bates Sts., Detroit..... 1889
Luce, W. O., Jr., Caro..... 1885
Lunn, G. D., Edmore..... 1885
Lusk, G. L., West Bay City..... 1886
Lyman, A. H., Manistee..... 1883
Lyman, Dr. M. R., Gagetown..... 1891
McCullough, Edward P., care Fred D. Stevens., Detroit..... 1890
McDonald, D., Kalamazoo..... 1884
McDonald, D. T., Red Jacket..... 1883
McDonald, Geo., Kalamazoo..... 1885
McEvoy, J. E., Manistee..... 1883
McFarland, A. E., 698 Michigan Ave., Detroit..... 1883
McGee, Thomas H., 417 Court St., Saginaw, W. S..... 1891
McKenna, J. D., Shepherd..... 1884
McKibbin, R. S., 322 Fort St., W. Detroit..... 1888
McMullen, G. H., Ionia..... 1883
MacKimmie, G. D., 28 Jefferson Ave., Detroit..... 1888
Malmgren, Gustav A., Iron Mountain 1887
Mann, Albert, Ann Arbor..... 1883
Mann, Chas. F., 845 3rd Ave., Detroit 1888
Martin, A. F., Imlay City..... 1884
Martin, C. L., Elk Rapids..... 1884
Martin, Henry, Jackson..... 1884
Martin, Susie A., Hopkins Station.... 1886
Martty, F. O., Bay City..... 1887
Mason, C. A., Flint..... 1885
Mason, G. B., Saline..... 1883
Mason, J. F., Warren..... 1888
Matthews, George McD., Chase..... 1891
Maxson, M. M., Hudson..... 1885
Mayer, F. W., Sebawing..... 1884
Merrill, A. C., Harbor Springs..... 1887
Meseroll, D. C., Jackson..... 1884
Mesick, H. J. Plainwell..... 1886
Miller, Archie T., Swartz Creek..... 1890
Miller, H. J., Vassar..... 1885
Millikin, T. J., St. Clair..... 1884
Mills, L. M., Grand Rapids..... 1886
Millspaugh, Martin Benedict, 98 North Union St., Grand Rapids..... 1890
Moore, John, Ann Arbor..... 1884
Moore, Lon. G., 505 S. Michigan Ave., Saginaw, W. S..... 1890
Morris, H. M., 919 Grand River Ave., Detroit..... 1888
Morris, S. S., Pinconning..... 1888
Morrison, A. W., Constantine..... 1885
Muir, J. D., Grand Rapids..... 1886
Murphy J. W., Battle Creek..... 1883
Myers, Theo. W., Saginaw..... 1890
Nasmyth, P. F., 388 Baker St., Detroit 1888
Nelson, E. H., 118 West Congress St., Detroit..... 1884
Newell, C. P., Flushing..... 1884
Niver, Mrs. W. H., Chesaning..... 1888
Nugent, W. A., Alpena..... 1891
Nutt, E. C., Cheboygan..... 1890
O'Brien, J. R., 297 First St., Detroit.. 1885
Orr, E. N., Manistique..... 1886
Orr, J. J., Tecumseh..... 1884
Orth, L. P., Traverse City..... 1886
Osborne, G. A., Luther..... 1887
Packard, Homer H., Cheboygan..... 1890
Palmer, Dr. Henry, St. Johns..... 1889
Parker, A. S., 747 Woodward Ave., Detroit..... 1888
Parker, G. J., Port Huron..... 1888
Parker, O. J., Howell..... 1889
Parkill, C. P., Owosso..... 1883
Parkill, S. E., Owosso..... 1888
Parkinson, E. A., Hart Mills..... 1885
Paquette, F. D., Ludington..... 1883
Parson, Chas. W., 99 Woodard Ave., Detroit..... 1890
Passage, J. H., Greenville..... 1886
Patenaude, A., Norway..... 1887
Patterson, B. M., 238 Randolph St., Detroit..... 1885
Pauly, L., St. Ignace..... 1887
Peck, A. W., Petoskey..... 1888
Peck, J. E., Grand Rapids..... 1885
Peckham, H. C., Freeport..... 1885
Pegg, H. D., Morenci..... 1884
Perham, Jason, Kent City..... 1888
Perry, D. B., West Bay City..... 1883
Perry, Fred R., W. Bay City..... 1898
Perry, F. W. R., 709 Woodward Ave., Detroit..... 1888
Pettitt, Charles E., Bad Axe..... 1890
Phelps, L. A., Saugatuck..... 1898
Phillips, E. F., Armada..... 1888
Phillips, F. S., Odgen..... 1884
Phillips, H. S., Carson City..... 1888
Phillips, W. R., Battle Creek..... 1883
Pierson, L. R., Des Moines, Ia..... 1888
Pike, N., Morley..... 1888
Potter, Frank P., Allegan..... 1892
Powell, A. H., Gladstone..... 1890
Power, J. O., Addison..... 1884
Prall, D. E., East Saginaw..... 1883
Pratt, G. O., 722 Antoine St., Detroit. 1884
Pratt, Stephen, Howell..... 1885
Prescott, A. B., Ann Arbor..... 1883
Price, Geo. A., Spring Lake..... 1892
Purvis, G. S., 983 Jefferson Ave., Detroit..... 1885
Raider, J. F. A., Newago..... 1883
Raizon, Dr. Jas., Wakefield..... 1888
Randolph, A. M., Northville..... 1883
Ray, G. C., West Bay City..... 1885
Raymo, Owen, Wayne..... 1888
Raynale, Frank B., Detroit..... 1891
Reidy, Mike, Corunna..... 1884
Remus, Wm., Pontiac..... 1892
Revell, Samuel, Roscommon..... 1888
Reynolds Linton E., 508 Michigan Ave., Lansing..... 1890
Rice, C. E., Lenox..... 1888
Rich, John W., Manistee..... 1885
Richards, F. P., 204 Jos. Campau Ave., Detroit..... 1885
Richmond, T. W., Bear Lake..... 1888
Riggs, Miles E., Cheboygan..... 1891
Ringler, Eugene, Saginaw..... 1884
Ripley, L. G., Montague..... 1884
Roberts, D. O., Kalamazoo..... 1887
Robinson, E. H., 2399 St. Catharine St., Montreal..... 1888
Rodenbaugh, H. W., Breedsville..... 1887
Rodenbaugh, J. N., Mancelona..... 1886

Rodenbaugh, O. S., Mancelona.... 1885
Rodgers, E. J., Port Huron 1884
Roeser, Otto W., Saginaw, W. S..... 1890
Rogers, A., Ravenna. 1888
Rogers, Arthur S., Vassar 1889
Ross, E. W., 147 Congress St. W., Detroit. 1884
Rothacher, Jacob W., 720 Gratiot Ave., Detroit. 1892
Roussin, V., Ludington..... 1884
Rudolphi, A. E., Dowagiac..... 1886
Rundel, J., Holton..... 1886
Runner, J. W., Shelby..... 1886
Russell, Dorian M., 166 W. Bridge St., Grand Rapids 1892
Russell, Elsworth E., Jackson. 1890
Sackett, S. M., Monroe..... 1883
Safford, O. P., Flint. 1883
Sawyer, R. J., Menominee..... 1883
Sayers, J. A., Seney..... 1885
Schlotterbeck, Julius O., Ann Arbor. 1890
Schmidt, Walter Karl, 84 Canal St., Grand Rapids 1892
Schott, A. A., East Saginaw..... 1888
Schrouder, Benj., 209 East Bridge St., Grand Rapids..... 1892
Schultz, L. S., St. Joseph 1885
Schumacher, A. B., Grand Ledge.... 1884
Schumacher, A. C., Ann Arbor..... 1887
Schuman, P. F., with Parke, Davis & Co., Detroit 1891
Scott, Dr. H. J., Seney. 1890
Scoville, G. R., Manistee. 1884
Scribner, David C., Grand Rapids ... 1892
Seeley, C. A., Lansing 1888
Selleck, Robert W., Flint..... 1890
Shaffer, John M., Gladwin..... 1889
Sherrard, Chas. C., 128 20th St., Detroit.. 1892
Sherwood, C. L., Dowagaic..... 1884
Shook, D. L., Coral 1884
Siebert, G. F., Iron Mountain 1888
Sigler, F. A., Pinckney 1885
Simoneau, Leander, Saginaw, E. S... 1890
Simoneau, Richard, T., Saginaw, E. S. 1890
Simpson, Floyd D., Flint 1891
Slawson, W. W., Greenville 1886
Sloan, E. E., Clarkston..... 1885
Smallidge, F. E., 701 Jefferson Ave., Detroit 1889
Smith, C. M., Clarkston 1883
Smith, Chas. E., Pontiac..... 1891
Smith, Fletcher, Saginaw 1888
Smith, Frank W., Hillsdale..... 1891
Smith, Dr. Harvey W., Carsonville... 1890
Smith, Samuel R., 217 Watson St., Grand Rapids 1892
Snow, H. W., Omaha, Neb. 1885
Snyder, Dr. Walter C., Horton, Jackson Co. 1890
Spalsbury, Duane, Three Rivers..... 1890
Spayde, W. H., Bloomingdale 1886
Speckhard, Adolphus O., Watersmeet 1891
Spencer, J. L., Linden..... 1883
Spencer, M. Ella, Linden 1884
Spofford, Rolin J., Bay City..... 1890
Sprague, W. G., Flushing 1883
Stafford, Edward O., Marquette..... 1890
Stafford, Jos., Newberry. 1890
Stanton, H. N., Sheridan..... 1885
Stanton, M. B., Sheridan..... 1885
Stearns, Fred'k K., Detroit..... 1891
Steele, Michael, Ionia 1885
Steinkohl, Fred'k, Manchester..... 1889
Stevens, A. B., Ann Arbor..... 1883
Stevens, C. R., Northville 1883
Stevens, F. D., 133 Woodward Ave., Detroit. 1883
Stiner, Jas. W., Unionville..... 1890
Stoeckly, Louis, Iron Mountain..... 1891
Stone, C. G., Detroit..... 1884
Stover, H. E., Kalkaska..... 1886
Stringer, G. W., 898 Michigan Ave., Detroit. 1884
Stringham, Wm. T., Shelby 1888
Summers, J. W. F., Gould City..... 1892
Swaby, G. A., Bay City 1885
Sweet, B. F., Carson City 1885
Sweetser, F. E., Port Huron 1888
Swift, George, 101 Griswold St., Detroit. 1888
Taylor, Mrs. C. W., Loomis 1885
Taylor, H. S., 54 Selden Ave., Detroit 1889
Temple, F. J., Ridgeway..... 1891
Tepoorten, Frank A., Bay City 1890
Terrill, Dr. B. E., Muir 1886
Thayer, A. R., 747 Emerson St., Saginaw, E. S 1890
Thompson, Frank A., Parke, Davis & Co., Detroit..... 1889
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Harrison, H. E.,	Moeller, J. C.,	Stanley, C. D.,	Yates, H. W.,
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Don't fail to send in one new name for membership before our next meeting; and don't make any plans for your next summer vacation until you hear from the Executive committee.

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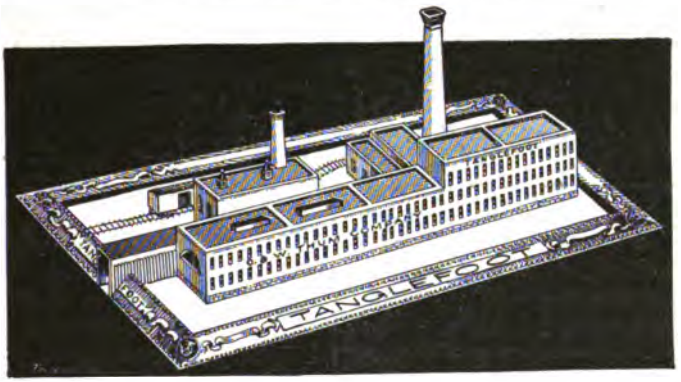
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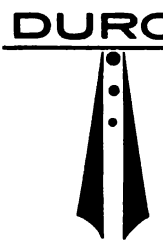
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